

SPECIES REVIEW:

DEMOISELLE CRANE (*Anthropoides virgo*)

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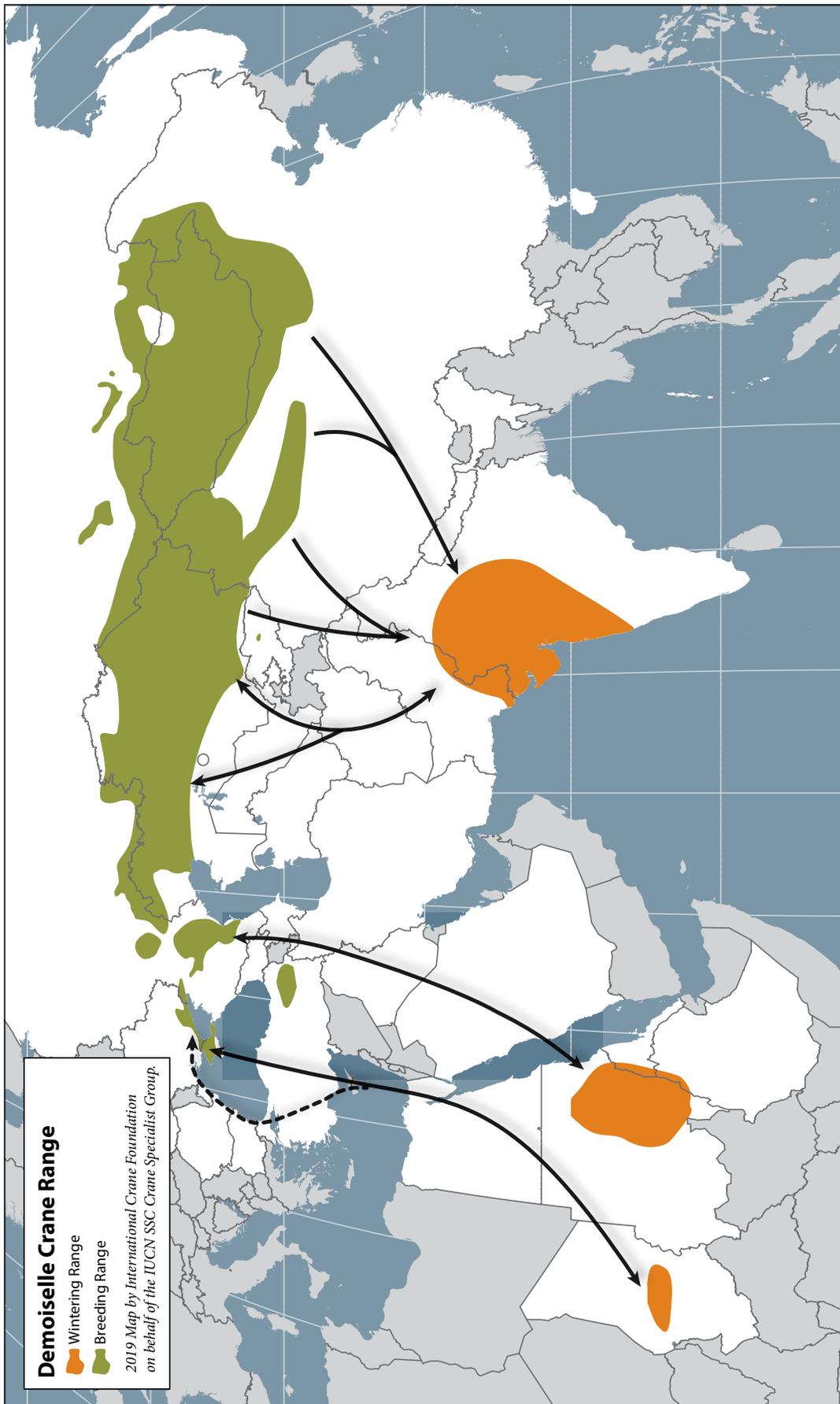
Demoiselle Crane in Kazakhstan steppe (Photographer: Oleg Belyalov, Kazakhstan Union for the Protection of Birds)

Red List Category: Least Concern

Population Size: 170,000–220,000

Population Trend: Decreasing

Distribution: Eurasia, winter in Africa and Indian subcontinent



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DISTRIBUTION AND STATUS OF KEY SITES

Overall Range

The current breeding range in Eurasia spreads from the south of Ukraine through the south of Russia, Kazakhstan, Kyrgyzstan, and across Mongolia to northeast China covering steppe and semi-desert zones of Central Eurasia.

Status of Key Sites

The extensive breeding range of the Demoiselle Crane on the Central Eurasian steppe can be conditionally divided into European, Kazakhstan/Central Asia, and East Asia parts. The most fragmented *European part* includes Azov-Black Sea, Middle Don, Caspian and Volga-Ural breeding flocks (Belik et al. 2011). Cranes of the most western Azov-Black Sea breeding flock inhabit southeast regions of Ukraine, Crimea, and Taman Peninsulas and southwest Rostov Province of Russia (Andryushchenko 2015). The smallest, the Middle Don River breeding flock, occurs mainly in Volgograd and partly Rostov Provinces. The Caspian breeding flock covers Republics of Dagestan and Kalmykia as well as Astrakhan, Rostov, Stavropol, and partly Volgograd Provinces, while the Volga-Ural breeding flock is located in Volgograd, Astrakhan, Saratov, and Samara Provinces in Russia and West Kazakhstan and Atyrau Provinces in Kazakhstan. The *Kazakhstan and Central Asia part* spreads from the South Ural (Orenburg, Chelyabinsk, and Kurgan Provinces), south of Central Siberia (Krasnoyarsk Province and Republic of Khakassia) and Altai in Russia through steppe, semi-desert, and desert to southeast foothills of Kazakhstan and foothills of Kyrgyzstan (Davygora and Gavlyuk 1991, Zavyalov et al. 2003, Berezovikov and Kovshar 2006, Kulagin 2014). The *East Asia part* covers Tyva and south of East Siberia (Baikal and Transbaikalia regions) of Russia (Ryabtsev 1999, Goroshko 2012), Mongolia (Tseveenmyadag 2005), and northern China (Inner Mongolia, Xinjiang, Heilongjiang, Gansu, and Jilin provinces) (Fan et al. 1994, Ma and Ma 2001). There were also two remnant disjunctive populations occurring on the *Atlas Plateau of northern Africa* (non-migratory population in Morocco, Tunis, and Algeria) (Latta and Archibald 1980, Urban 1987) and in *Eastern Turkey* (Kasperek 1988, Akarsu et al. 2013), both of which are probably now extinct.

Demoiselle Cranes from the European part of the range fly to wintering grounds in Chad, Sudan in the Blue and White Nile Basin, and Ethiopia (Urban 1987, Gebremedhin et al. 2009). Birds from Azov-Black Sea breeding flock migrate to the Republic of Chad through Turkey, Cyprus, and Egypt, crossing Black and Mediterranean Seas and making stopover in Sivash Bay in Crimea and in Cyprus (Atta 1996, Andryushchenko 2015). Cranes from Caspian, Volga-Ural, and probably Middle Don breeding flocks fly over the Caucasus Range through Dagestan in Russia, Georgia, Azerbaijan, Armenia, Iran, Iraq, and Saudi Arabia. Their main staging area is in the Manych-Gudilo Lake System in North Caucasus Region of Russia, and migration stopovers are in the Aras River Basin in Nachichevan Autonomous Region of Azerbaijan and Urmia Lake in Iran (Belik et al. 2011, Andryushchenko 2015, Ilyashenko et al. 2018).

Cranes from Kazakhstan and Central Asia, as well as from East Asia part of the range, migrate to wintering grounds in Rajasthan and Gujarat Provinces, mainly in Arabian Sea coast, in the Indian subcontinent (Kanai et al. 2000, Guo and He 2017). They cross Uzbekistan (Lanovenko et al. 2011), Kyrgyzstan (Toropova and Kulagin 2011), Afghanistan, Pakistan (Ahmad and Shan 1991), and the Tibetan Plateau in China (Kanai et al. 2000). Largest staging areas are known in north Kazakhstan (Bragin 2011); cranes then fly almost nonstop, with only short-term rests. Data from satellite-telemetry tracking has indicated that birds from eastern Kazakhstan use two migration routes: one flying directly over the Himalayas, with the other detouring around the Hindu Kush Mountains (Kanai et al. 2000). The bulk of the East Asian part migrates to India through Nepal over the Himalayas, with the major stopovers at Torey Lakes in Transbaikalia in Russia (Goroshko 2012), in Buyant River

Valley in Mongolia (Bukreev et al. 2011), and in Brakol Lake (Xinjiang Province) in China (Kanai et al. 2000). Major pre-migration gathering sites in Mongolia include Baruun Turuun, Tarialan, Zereg Lake, Airag Lake, Tsagaannuur, Selenge River Delta, Kharkhorin, Khurkh River Valley, Bayan-Adraga, Norovlin, and Bayan-Uul fields, and Mongol Daguur. Demoiselle Cranes from Khurkh River Valley staged in the southern part of Inner Mongolia and then flew across the Tibetan Plateau and Nepal then over the Himalaya to reach their wintering grounds (Nyambayar Batbayar, personal comm. 2017). Research indicates that at least some cranes from East Asia make a circular migration during autumn and spring: they return to breeding grounds through northwest Pakistan, Afghanistan, Uzbekistan, and Kazakhstan (Gavrilov 1977, Kovshar and Berezovikov 1991, Gavrilov and Van der Ven 2004, Lanovenko and Kreitsberg 2006, Lanovenko et al. 2011, Toropova and Kulagin 2011, Guo and He 2017). Occasional cranes winter in eastern China, with reports from Hubei, Henan, Jiangxi, and Anhui Provinces (Fan et al. 1994, Ma and Ma 2001).

ECOLOGY

The Demoiselle Crane is one of the least water-dependent species among the cranes of the world. Across the great part of its breeding range, like any other steppe species, it is greatly affected by cyclic climate conditions of this geographical zone. Demoiselle Cranes usually stay relatively close to rivers, shallow lakes, or other natural wetlands, as well as artesian water sources and irrigation systems, to have access to drinking water. In dry years, cranes move to the forest-steppe zone for breeding (Bold et al. 2004, Tseveenmyadag 2005; Oleg Goroshko, personal comm. 2016). In years with high precipitation, Demoiselle Cranes can inhabit semi-deserts and even true deserts if water is available (Bold et al. 2004). The Demoiselle Crane prefers open plain or hilly habitats with low and very sparse grass or even without vegetation in both natural and transformed landscapes (Andryushchenko 2011). Birds in the *European part*, and partly in *Kazakhstan/Central Asia* and *East Asia parts*, have adapted to nesting in agricultural fields (Andryushchenko 2011, Goroshko 2012, Belik 2015). In pre-migratory and migratory seasons and at wintering grounds, crane flocks gather in agricultural fields and roost at night in shallow open water. Winter habitat in east-central Africa includes savannas, grasslands, and riparian areas, while in the Indian subcontinent Demoiselle Cranes feed in agricultural fields and roost on sandbars and mudflats surrounded by water (Meine and Archibald 1996). They can successfully winter even in deserts of Rajasthan, where artificial feeding is provided by local people in Khichan Village (Pfister 1996).

NUMBERS AND TRENDS

The total population of the Demoiselle Crane is estimated at 170,000–220,000 birds (Table 1), which is lower than the estimate in the 1996 estimate of 200,000–240,000 (Meine and Archibald 1996). The increases in the central and northern parts of the species' range has only partially compensated for population decreases in the south, west, and east of the breeding range. Long-term drought and the agriculture crisis following the collapse of the Soviet Union (Ilyashenko 2018) led to the shifting of their range to the north in the forest-steppe zone, where numbers slightly increased as crane bred on fallow lands. The southern edge of their range also moved to the north due to long-term drought.

In the *European part*, the crane numbers have diminished mainly in the Caspian and Azov-Black Sea breeding flocks, where breeding habitat continue to decrease due to the continued crisis in livestock farming, drought, and intensification of arable agriculture (Belik et al. 2011, Andryushchenko 2015). The total number in the Volga-Ural breeding flock is relatively stable or slightly increased, with declining numbers in the south, stable numbers in the center, and increasing numbers in the north of this area (Bidashko et al. 2006). Similar changes occurred in the *Kazakhstan/Central Asia part*, with total numbers decreasing, mainly because of rapid decline in the south and southeast (Kovshar 2010).

Table 1. Comparison of size of Demoiselle Crane populations in mid-1990s and 20 years later.

Parts of the range (Breeding flocks)	Estimated numbers mid-1990s	Current estimated numbers mid-2010s	Trend
European Part (Ukraine, Russia, and West Kazakhstan)			
<i>Azov-Black Sea</i>	600-700 (Andryushchenko 1999)	540-600 (Andryushchenko 2015)	Decrease
<i>Middle Don</i>	Not determined	200-300 (Belik et al. 2011)	?
<i>Caspian</i>	40,000-50,000 (Mishchenko et al. 2004)	30,000-40,000 (Belik et al. 2011)	Decrease
<i>Volga-Ural</i>	Not determined	15,000-17,000 (Bidashko et al. 2006, Belik et al. 2011)	Decrease
Subtotal	Over 50,000-60,000	45,000-58,000	Decrease
Kazakhstan and Central Asia Part (Russia, Kazakhstan, and Kyrgyzstan)			
<i>South Ural</i>	Few hundreds (Davygora 2005)	2,500-3,000 (Korovin 2009)	Increase
<i>Altai</i>	Not determined	4,000 (Irisova 2007)	Increase
<i>Kazakhstan flock</i>	100,000 (Berezovikov and Kovshar 2006)	50,000-60,000 (Kovshar 2010)	Stable in the north and center and decrease in the south, east, and west
<i>Kyrgyzstan flock</i>	100-120 (Toropova and Kulagin 2011)	20-40 (Kulagin 2014)	Decrease
Subtotal	Over 100,000	57,000-67,000	Decrease
East Asia Part (Russia, Mongolia, China)			
<i>South of Central Siberia</i>	600-700 (Prokofiev 1991)	3,000 (Savchenko and Yemelianov 2012, 2014)	Increase
<i>Baikal and Transbaikalia</i>	22,000-27,000 (Goroshko 2002, Goroshko and Tseveenmyadag 2002)	12,000-15,000 (continue to decline) (Goroshko 2012)	Decrease
<i>Mongolia</i>	80,000-90,000 (Tseveenmyadag 2005)	40,000-70,000 (N. Batbayar, personal comm.)	Stable in the north and center, but decrease in south, east and west
<i>North-west China</i>	Not determined	10,000 (Xing et al. 2005; L. Su, personal comm. 2016)	Decrease
Subtotal	Over 110,000-120,000	Over 65,000-98,000	Decrease
Atlas Plateau population (Northern Africa)	Few birds (JDR Vernon, ICF archive)	0 (no records since 1983) (Ilyashenko and Ilyashenko 2011; G. Scheres, personal comm.)	Probably extirpated
Eastern Turkey	40-60 (Kasperek 1988)	0 (no records since 2004) (Akarsu et al. 2013)	Probably extirpated
TOTAL	Est. 200,000-240,000 (Meine and Archibald 1996)	Est. 170,000-220,000 (Ilyashenko 2016)	Decrease

In the *East Asia part*, numbers have diminished in eastern Chinese provinces due to fast economic development (Liying Su, personal comm. 2016). In Transbaikalia in Russia and in the east, south, and west of Mongolia, numbers have declined due to long-term drought since the early 2000s, while in the center and north it is stable or slightly increased (Goroshko 2015; Nyambayar Batbayar and Tseveenmyadag Natsagdorjiyn, personal comm. 2016).

THREATS

Overall Range Threats

- Rapid economic development (intensive agriculture and livestock farming, wetlands transformed to reservoirs, urbanization) has caused habitat degradation, especially in Ukraine, northeast China, eastern Turkey and North Africa (Ilyashenko and Ilyashenko 2011, Akarsu et al. 2013; G. Scheres, personal comm. 2016);
- Disturbance during agricultural work, livestock grazing, and uncontrolled hunting as well as unorganized tourism on the breeding grounds, staging areas, stopovers, and wintering grounds (Pfister 1996; Tseveenmyadag 2005; Gebremedhin et al. 2009; Andryushchenko 2011, 2015; Goroshko 2012; Kulagin 2014); and
- Collision with power lines (Gombobaatar and Monks 2011, Malovichko et al. 2011).

Migration Flyways

- Live trapping and hunting in Pakistan and Afghanistan along the flyway for food, captive breeding, sale, and sport purposes (Perveen and Khan 2010); uncontrolled hunting in Central Asia, especially in private game areas (Bragin 2011, Mitropolsky 2011); and mass, indiscriminant killing of crane flocks in Saudi Arabia for sport purposes.
- Shooting in response to crop depredation in staging areas and wintering grounds (Parasharya et al. 1998, Goroshko 2010); and
- Secondary poisoning (cranes killed from consuming poisoned grain set out to kill rodents).

Breeding Grounds

- Changes in agricultural land use in Ukraine, Russia, and Kazakhstan after the collapse of the Soviet Union. This led to declines in livestock, overgrown pastures, and disappearance of artesian wells, increasing the area of abandoned fields, and breakdown of irrigation systems that had provided valuable crane habitat (Bragin 2011, Belik 2015, Ilyashenko 2018). The collapse also caused declines of crop cultivation and in turn overgrown, abandoned fields with weeds (mainly in the *European part* of the range);
- Expansion of the areas under agricultural crops unfit for cranes (certain perennial grasses, vineyards, olive [*Olea europaea*] groves and orchards), or crops that need frequently watered land (rice [*Oryza sativa*] paddies), especially in Ukraine, Turkey, and Morocco (Andryushchenko 2011, Ilyashenko and Ilyashenko 2011);
- Overgrazing, mostly in *Kazakhstan/ Central Asia* and *East Asia parts* (Gombobaatar and Monks 2011, Kulagin 2014; O. Belyalov, personal comm. 2015);
- Destruction of crane clutches by machines in agricultural fields during farm work, especially in Azov-Black breeding flocks where row crops prevail (Andryshchenko 2011);
- Poisoning against rodents in agricultural lands and crane roosting sites (Nankinov 2009, Andryushchenko 2011, Goroshko 2012, Belik 2015);

- Reduction of water resources due to climate warming, long-term severe drought (2000–2016) in steppe and semi-desert zones of central Eurasia, and destruction of irrigation systems (Belik et al. 2011, Goroshko 2011, Malovichko et al. 2011);
- Declining water availability both in breeding and non-breeding seasons caused by concreting of canals, overgrowth of reeds and brush around artesian wells and canal banks, and reduction of irrigation canal use due to high cost of water and inappropriate management (Andryushchenko 2015);
- Extensive fires in steppe and semi-desert areas of *European part* and Tranbaikalia Region of Russia and Kazakhstan caused by the degradation and overgrowing of neglected pastures and poor fire control since the beginning of the 1990s, after the collapse of the USSR (Bukreeva 2003, Bragin 2011, Goroshko 2012, Belik 2015). This threat was worsened by the long-term drought during the last decade. Grass composition afterwards is changed and such areas can become unsuitable for Demoiselle Crane breeding (Belik et al. 2011);
- Misguided management in special protected areas in the steppe zone in Russia and Ukraine, such as a ban on moderate livestock pasturage (Belik 2015), which led to heavier vegetative cover in previously suitable breeding habitats;
- Increase in number of predators, primarily herding and stray dogs (*Canis lupus familiaris*) and corvids (*Corvidae*) (Bukreeva 2003, Gebremedhin et al. 2009, Andryushchenko 2011, Goroshko 2012);
- Collection of eggs and chicks for illegal trade and exchange between private collectors and breeders (Andryushchenko 2011);
- Significant disturbance at sites where cranes gather in summer and before migration due to tourism developing in Black and Azov Seas coast area (Andryushchenko 2015); and
- In Mongolia, significant disturbance from livestock gathering at shallow water points is widely observed during spring and summer periods, causing cranes to move to unsuitable areas.

CHANGES SINCE 1996

- Apparent extirpation of the Atlas Mountains population in North Africa (there have been no confirmed sightings of birds for over 20 years) and of the breeding population in Eastern Turkey due to rapid economic development;
- Shrinkage and fragmentation of habitats at the southern border of the species' breeding range related to long-term drought in the Central Eurasia steppe and the agriculture crisis in the former Soviet Union region, as well as with declining crane numbers in the dry steppe and semi-desert zones (Kovshar 2010, Belik et al. 2011). On the other hand, the breeding range had expanded in a northern direction into the forest-steppe up to 52–53°N, where crane numbers increased (Fefelov 2008, Korovin 2009, Goroshko 2012);
- Recovering of steppe habitats in 8–10 years after their conversion from agricultural fields to fallow lands during the crisis in agriculture led to the stabilization of Demoiselle Crane numbers in Ukraine (Andryushchenko 2011) and even to its increase in the south of Russia (Zavyalov et al. 2003, Korovin 2009), northwestern and northern parts of Kazakhstan (Bragin 2011), and in Mongolia (Nyambayar Batbayar, personal comm.2016), especially when they are moderately grazed; and

- Significant reduction in number and area of wetlands due to creation of numerous dams and redistribution of water resources. Plowing of flooded meadows has led to conversion of riparian meadows to canals with steep banks overgrown with reeds and declining water availability for cranes (Andryushchenko 2015).

CONSERVATION AND RESEARCH EFFORTS UNDERWAY

- There are a number of regional and local crane working groups (Crane Working Group of Eurasia, Ukrainian Crane Working Group, Uzbekistan Crane Working Group, Kazakhstan Bird Conservation Union, Indian Crane and Wetlands Working Group, and the Doga Dernegi in Turkey) that coordinate conservation efforts for Demoiselle Cranes across its range, including monitoring, networking, research, and ecological education activities;
- Satellite-telemetry tracking studies of migration routes in eastern Kazakhstan and East Asian (Transbaikalia) region of Russia and Mongolia were conducted in cooperation with the Wild Bird Society of Japan (Kanai et al. 2000);
- Researchers from the Wildlife Science and Conservation Center of Mongolia and the Mongolian Academy of Sciences have started tracking 22 Demoiselle cranes from the Khurkh River Valley in northeast Mongolia since June 2016;
- A project for long-term monitoring of the breeding population in the Khurkh and Khuiten River Valley has started in Mongolia with the cooperation from the Wildlife Science and Conservation Center of Mongolia, Mongolian Academy of Sciences, and the International Crane Foundation;
- A project on hunting regulations and hunters' education was implemented in Afghanistan, Pakistan, Kazakhstan, and Uzbekistan along the Demoiselle Crane flyways, supported by Mohamed bin Zayed Species Conservation Fund. Under this project, "*Guidelines on crane captive breeding*" was published in Pakistan as a tool intended to reduce captures of cranes for captive keeping;
- At the wintering grounds in Rajasthan in India, cash donations from local people and visitors are managed by "*Kuraj Samrakshan Vikas Sansthan, Pakshi Chugha Ghar, Khichan*," a society established in Khichan for crane protection. Marwar Crane Foundation (MCF) has been set up recently to recognize and support the initiative of a villager from this community, whose crane feeding activities brought national and international attention to this village as an excellent bird watching site. The Government of Rajasthan has recently recognized this place as a tourist destination;
- New protected areas at the key breeding grounds of the Demoiselle Crane were established in Southeast Siberia (Goroshko 2012); and
- Daurisky State Nature Reserve (Transbaikalia Region, Russia) worked with farmers on establishing lure crop fields to reduce crop damage near Torey Lakes at the sites of mass pre-migratory and migratory concentrations of cranes, and to reduce conflicts between farmers and the nature reserve (Goroshko 2010).

PRIORITY RESEARCH AND CONSERVATION ACTIONS

At present, on a species level the Demoiselle Crane has sufficiently robust numbers and a wide enough range to absorb current threats. Yet its numbers are in decline in many areas. Priority actions include the following:

- Identify priority areas for monitoring of the Demoiselle Crane in the different parts of the breeding range to determine long-term impacts of climate change and anthropogenic factors. Give priority to areas where the species' numbers have declined or are critically small, such as Azov-Black Sea and Caspian breeding flocks in the *European part*, south and southeast Kazakhstan and remaining pairs in Kyrgyzstan in *Kazakhstan/Central Asia part*, and Transbaikalia and Inner Mongolia in *East Asia part*;
- Establish a coordinated scheme to count cranes at pre-migration gathering sites across the range. Something like a “*Mid-August Sandhill crane count*” event, engaging all countries within the species range, could be useful to monitor the population numbers;
- Identify current wintering grounds in Northeast Africa (Ethiopia, Sudan, Chad) through tagging of Demoiselle Cranes in the *European part* with color plastic rings, and satellite and cellular transmitters. Received data will also provide information about individual movements at breeding grounds and migration stopovers along flyways;
- Determine key sites along flyways and use the international flyway program data to assess their protection status and needs;
- Promote sound captive breeding, ecological education, and implementation of alternative livelihood projects to reduce shooting and live-trapping of migrating cranes in Afghanistan and Pakistan;
- Strengthen control of hunting and education of hunters to reduce illegal hunting at the key stopovers in southeast Siberia, Kazakhstan, and Central Asia and along flyways;
- Increase education and public awareness activities for herdsmen, volunteers, children, and other members of the public in regions where cranes migrate, rest, and winter;
- Provide appropriate management of crane flocks and education of farmers to reduce conflicts between cranes and farmers;
- Maintain or restore regional populations through effective protection of the cranes and habitats in Turkey and in southern Ukraine, and consider a future possibility for restoration of the species in southwestern Ukraine, the Balkans, and the Iberian Peninsula;
- Prevent crane collisions with power lines and wind power turbines at major crane staging areas and migration stopovers. Power lines at these locations should be marked or otherwise modified to reduce the incidence of accidental collisions;
- Improve management at breeding and wintering sites, including adequate protection and organized tourism (Kichan, other sites in India);
- Develop preventive measures against steppe fires and organize effective management of wild fires;
- Develop and provide legislative support for measures to restore Demoiselle Crane habitats within steppe reserves and national parks in the *European part* of the range through creation of water sources and moderate grazing; and
- Increase awareness among herders and farmers on how to prevent herding dogs from depredating the eggs and chicks of cranes.

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