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(100091)

2014 10 2015 2 (Grus leucogranus) 6 2014 4 2015 (5 594.83±371.70) km (n=4) (57.51±8.61) d (n=4) 2015 (5 366.66±61.19) km (n=4) (51.52±9.68) d (n=4) F=1.47 p=0.27 F=0.86 p=0.39

Q958.13 Q959.7+26 A 1672-5948(2016)03-347-07

(Grus leucogranus) (International Union for Conservation of Nature IUCN) (Critically Endangered) (http://www.iucnredlist.org) I [1] [2] (Fereydoon Kenar) [3,4] 2008 1 [5~7] (Keoladeo National Park) 2002 [4,8,9] 99% 2012 3 800 4 000 [10] Sauey R T[8] (5 312.8±260.6) km (4 903 5 586 km n=5) 1995 1996 Kanai Y [11] 13 11 5 9 10 -5

2016-05-13 2016-06-03
(2130211-15-004)
(1989-) E-mail: icelxming@163.com
E-mail: cranenw@caf.cn

[illegible] 23.6 d (n=6) [illegible] 7.3 d (n=3) [illegible] 5.8 d (n=4) [illegible]

1 [illegible]

1.1 [illegible]

[illegible] 1 050 km² [illegible] 6 [illegible] (Grus japonensis) [illegible] (Grus vipio) [illegible] (Anthropoides virgo) [illegible] (Grus grus) [illegible] (Grus monoch) [illegible] [12,13] [illegible] 1 440 km² [illegible] [11] [illegible] [14,15] [illegible] 330 km² [illegible] [10,16~18] [illegible]

1.2 [illegible]

[illegible] 6 [illegible] 2014 10 19 [illegible] 2 [illegible] 951 [illegible] 952 [illegible] 2014 10 22 [illegible] 3 [illegible] 953 [illegible] 954 [illegible] 955 [illegible] 2015 2 2 [illegible] 1 [illegible] 956 [illegible] 6 [illegible] 951 [illegible] 952 [illegible] 2013 [illegible] 2014 [illegible] 953 [illegible] 954 [illegible] 955 [illegible] 956 [illegible] 2015 2 1 [illegible] (1) [illegible] HQBP3622 [illegible] 55 mm×26 mm×36 mm [illegible] 22 g [illegible] GPS [illegible] (GSM) [illegible]

1.3 [illegible]

[illegible] A [illegible] B [illegible] C [illegible] D [illegible] 5 [illegible] A

1 2014 2015

Table 1 Banding data of tracked Siberian Cranes during 2014-2015

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible] (g)
951	[illegible]	2014 10 19	Q02-1711	4AD7A3	[illegible]	6 200
952	[illegible]	2014 10 19 – 11 21	Q02-1712	4AD526	[illegible]	6 800
953	[illegible]	2014 10 22	Q02-1713	4AFFB5	[illegible]	7 000
954	[illegible]	2014 10 22 – 11 18	Q02-1714	4B0330	[illegible]	7 400
955	[illegible]	2014 10 22	Q02-1715	4B2FE9	[illegible]	7 800
956	[illegible]	2015 2 3 – 2016 1 14	Q02-1717	CAF005	[illegible]	5 000

[illegible] 951 [illegible] 952 [illegible]

D 5 m 10 m 20 m 50 m ArcGIS10.2 Arc-GIS10.2 SPSS 19

2

6 951 953 955 2014 2015 952 954 2014 956 2015 954 2014 11 18

11 26 952 2014 11 21 2015 1 21 952 954

2.1

3

1)

1 (a 951 b 952 c 953 d 954 e 955 f 956)

Fig.1 Migration routes of the tracked Siberian Cranes

(a: Number 951; b: Number 952; c: Number 953; d: Number 954; e: Number 955; f: Number 956 Siberian Crane)

2015 951 953 955 956 2015 (5 594.83±371.70) km (5 264.63 5 933.66 km) (57.51±8.61) d (50.17 66.83 d) (50.14±8.43) d (42.00 59.71 d) 2015 (5 366.66±61.19) km (5 300.20 5 428.89 km) (51.52 ± 9.68) d (40.38 64.00 d) (42.05±6.08) d (33.04 45.88 d)(2) 2015 (F=1.47 p=0.27 F=0.86 p=0.39 F=2.42 p=0.17)

2.2

2 (2) 80 km 350 km 2014 2015 6 3 3 (n=1) (n=1) (n=2) 2 (3) (n=3) (n=5) 1

3

3.1

Kanai Y[11] Kanai Y (5 366.66±61.19) km Kanai Y (5 312.8±260.6) km[11] (F=0.16 p=0.70) Kanai Y[11] Sauey R T[8] [19] [20,21]

2 2015

Table 2 Migration distance, migration time and roosting time of the tracked Siberian Cranes

		951	953	955	956	±
	(d)	66.83	62.83	50.17	50.21	57.51 ±8.61
	(d)	59.71	54.63	44.21	42.00	50.14±8.43
	(km)	5 899.23	5 933.66	5 264.63	5 281.81	5 594.83±371.70
	(d)	40.38	64.00	50.42	51.29	51.52±9.68
	(d)	33.04	45.54	43.75	45.88	42.05±6.08
	(km)	5 330.46	5 300.20	5 407.08	5 428.89	5 366.66±61.19

2

Fig.2 Migration routes over the Bohai Sea of the tracked Siberian Cranes

3

Fig.3 Migration routes over the Dabie Mountain area of the tracked Siberian Cranes

109 km

450 km

[22]

3.2 (2)

(3)

[1]

50 km 200 km 1 500 m 1 777 m 500 1 000 m 2 116 m) 700 1 300 m 2 035 m) 500 800 m 1 429 m) 1 500 2 000 m 2 482 m) 1 000 2 000 m 2 389 m) 1 100 2 500 m 3 147 m)

3.3

956

6

[23]

952 954

2014 2015

951 953 955

2014 10 2015 2 951 953 955 2014 2015

[1] . [M]. : , 2012.

[2] , , . [M]. : , 1998.

[3]Kanai Y, Nagendran M, Ueta M, et al. Discovery of breeding grounds of a Siberian Crane Grus leucogeranus flock that winters in Iran, via satellite telemetry[J]. Bird Conservation International, 2002, **12**(4): 327-333.

[4]Meine C, Archibald G. The cranes: status survey and conservation action plan[M]. IUCN, 1996.

[5]Bragin E. Siberian Crane sightings in north Kazakhstan in spring 2013 and 2014[J]. Siberian Crane Flyway News, 2014, **6**(13): 5-6.

[6]Rusanov G. A sighting of the Siberian Crane in Volga Delta, Russia, in autumn 2013[J]. Siberian Crane Flyway News, 2014, **6**(13): 6-7.

[7] . (Grus nigricollis) (Grus leucogeranus) [D]. : , 2009: 10-12.

[8]Sauey R T. The range, status, and winter ecology of the Siberian Crane (Grus leucogeranus)[D]. Ithaca: Cornell University, 1985: 191-197.

[9]Vardhan H. Autumn migration and wintering 2002/2003 in central flyway[J]. Siberian Crane Flyway News, 2002, **12**(3): 7-8.

[10]Li F S, Wu J D, James H, et al. Number and distribution of cranes wintering at Poyang Lake, China during 2011-2012[J]. Chinese Birds, 2012, **3**(3): 180-190.

[11]Kanai Y, Ueta M, Germogenov N, *et al*. Migration routes and important resting areas of Siberian Cranes (*Grus leucogeranus*) between northeastern Siberia and China as revealed by satellite tracking[J]. Biological Conservation, 2002, **106**(3): 339-346.

[12]Ma Y, Li X. The population and habitat of cranes in China's nature reserves[C]//The future of cranes and wetlands. Proceedings of the international symposium held in Tokyo and Sapporo, Japan, 1993: 141-145.

[13]Zhang F. Conservation of wetlands and cranes in China[M]//The Future of Cranes and Wetlands. Proceedings of the international symposium held in Tokyo and Sapporo, Japan, 1993: 130-135.

[14] , , , . [J]. , 2007, **41**(6): 82-91.

[15] , , . [J]. , 1991, **12**(5): 21-24.

[16] , , , James Burnham. [J]. , 2013, **11**(3): 305-312.

[17] , , , . 2012 [J]. , 2014, **42**(1): 39-43, 51.

[18] , , , . [J]. , 2012, **33**(4): 355-361.

[19] , , , . [J]. , 2007, **39**(2): 106-111.

[20] . [D]. : , 2012: 21-24.

[21] , , , . [J]. , 2007, **42**(3): 68-72.

[22]Rappole J H, King D I, Diez J. Winter-vs. breeding-habitat limitation for an endangered avian migrant[J]. Ecological Applications, 2003, **13**(3): 735-742.

[23]Newberry R C. Environmental enrichment: increasing the biological relevance of captive environments[J]. Applied Animal Behaviour Science, 1995, **44**(2): 229-243.

Migration Routes of Siberian Crane (*Grus leucogeranus*) in Spring and Autumn by Satellite Tracking

LI Xiuming, XU Jiahui, QIAN Fawen

(Research Institute of Ecology, Environment and Protection, Chinese Academy of Forestry, Beijing 100091, P.R.China)

Abstract: From October 2014 to February 2015, six Siberian Cranes (*Grus leucogeranus*) had been installed satellite trackers at stopover and wintering sites. Five of them provided fall migration information in 2014, and 4 birds completed spring and autumn migration in 2015. The results showed that 3 birds tracked flew to Poyang Lake as their wintering ground in China; their breeding ground located in the Arctic tundra between lower Yana River and lower Indigirka River in Republic of Sakha of Russia; all important stopover sites were in the marshes of southwest Songnen Plain in northeast China, which included the marshes in Momoge National Nature Reserve and Xianghai National Nature Reserve in Jilin province, Tumuji National Nature Reserve in Inner Mongolia Automous Region, and surrounding wetlands; the wetlands in Qiqihar became less important as stopover sites for Siberian Crane in this study; the migration routes in spring and autumn were roughly similar, but neither strictly migrating along the same route, nor roosting at the same stopover sites except the marshes in southwest Songnen Plain; the migration distance was (5 594.83±371.70) km (n=4) and migration time was (57.51±8.61) days (n=4) in spring 2015, and migration distance was (5 366.66±61.19) km (n=4) and migration time was (51.52±9.68) days (n=4) in fall 2015, there is not significant difference on migratory distance and time between spring and autumn migration (migration distance: F=1.47, p=0.27; migration time: F=0.86, p=0.39); different migration strategies were adopted by the tracked birds in spring and autumn migration when they flew over the Bohai Sea and Dabie Mountain. In addition, the research showed that it is feasible to release the rescued cranes into the wild in order that they return back to the wild population.

Keywords: *Grus leucogranus*; satellite tracking; migration route; migration strategy