



Short Communication

Hunting Pressure on Migratory Demoiselle Cranes in Pakistan

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ABSTRACT

This study was conducted to assess hunting pressure on Demoiselle cranes (*Anthropoides virgo*) in South Waziristan, Pakistan from October 2015 to January 2016. The data were collected by questionnaire survey. A total of 110 hunters were interviewed from 10 different hunting camps and record of capturing was documented from 2012 to 2015. The results revealed that 11.8% (n=13) hunters captured the cranes by hand, 36.4% (n=40) hunters captured them by Soai, while 51.4% (n=57) hunters employed both of these methods to capture cranes. In total, 7947 cranes were captured during the study period. Age wise segregation showed that 6624 (83.4%) of captured cranes were adults and 1323 (16.6%) sub-adults. Among the adult cranes, 3279 (49.5%) were males and 3345 (50.5%) females. Cranes captured during spring and fall from 2012 to 2015 included 1021 and 502; 981 and 527; 787 and 311 and 843 and 462 respectively. The difference between the spring and fall capture shows that significant mortality occurs during residence at summer quarters and return migration. In late August through September, they gather in flocks of up to 400 individuals and prepare for their flight to their winter range. During their migratory flight south, demoiselles fly like all cranes, with their head and neck straight forward and their feet and legs straight behind, reaching altitudes of 16,000–26,000 feet (4,900–7,900 metres). Along their arduous journey they have to cross the Himalayan Mountains to get to their over-wintering grounds in India. Many die from fatigue, hunger and predation from golden eagles. Simpler, lower routes are possible, such as crossing the range via the Khyber Pass. However, their presently preferred route has been hard-wired by countless cycles of migration. At their wintering grounds, demoiselles have been observed flocking with common cranes, their combined totals reaching up to 20,000 individuals. Demoiselles maintain separate social groups within the larger flock. In March and April, they begin their long spring journey back to their northern nesting grounds. The hunters had no hunting permits for hunting and most people hunted for recreation, pet, captive breeding and sale. The present study concludes that demoiselle cranes are being illegally hunted at a large scale in the study area resulting in decline in their population. There is a dire need of law enforcement to conserve the bird species in the study area.

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Authors' Contribution

MS contributed in data analysis and preparation of the manuscript. AH collected data. IH supervised the study.

Key words

Demoiselle cranes, Migration, Illegal hunting

Cranes migrate via Indus Flyway to winter at various destinations in Pakistan. In northern Pakistan, cranes fly back over the Indus, Kurram, Gambela, Kashew and Gomal Zam rivers (Farooq *et al.*, 1993; Khan, 2004).

Demoiselle cranes (*Anthropoides virgo*) migrate through Pakistan between their breeding and wintering grounds. The species is rated categorized as 'Least Concern' in the IUCN Red List of Threatened Species (IUCN, 2016) but it has a conservation status of protected species throughout Pakistan. During migration through Pakistan, Demoiselle cranes come across heavy odds of hunting pressure, physical barriers, inclement weather, predators, food scarcity, inhospitable habitats, disappearance of wetland habitat and toxins such as pesticides, all of which

impact their continued survival (Mian, 1981; Nawaz *et al.*, 2006). Demoiselle cranes are hunted for sport, food, and pets in Pakistan and Afghanistan during their autumn and spring migration. In other areas, Demoiselles are shot or poisoned due to the crop damage they cause (Farooq, 1992).

The two provinces of Pakistan, Khyber Pakhtunkhwa Province and Balochistan are well known for crane hunting (Roberts and Landfried, 1987; Perveen and Khan, 2010). The Banuchi, Wazir and Marwat Pathan tribesmen hunt migratory cranes by special means of trapping devices called Soai (in Pashtoo language). It is a long string, as long as 50 m, having a ball, the size of a golf ball.

The present study was aimed to investigate hunting pressure on demoiselle cranes migrating through Wana, South Waziristan Agency. The data would be useful for effective conservation of this species.

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Materials and methods

The study was carried out in Wana, South Waziristan Agency (32°18'2.98"N, longitude 69°31'33.13"E), FATA (Federally Administered Tribal Areas) district in northern Pakistan. The study area is bounded in the north by the North Waziristan Agency, in the east by adjoining Tank and Dera Ismail Khan Districts, in the south by Zhob District of Balochistan Province and in the west adjoining by Afghanistan. The area has moderately hot summer and very cold winters. In winter, the temperature decreases below freezing point at high altitudes. The summer season starts in May every year and ends by September; June is generally the warmest month when the mean maximum temperature rises slightly over 30°C. Agency receives mean annual rainfall of around 150 mm while a small area in the southeastern corner receives less than 254 mm of rainfall annually (Pakistan Meteorology Department, Islamabad).

The major natural flora observed at the study sites consist of trees namely *Pinus gerardiana*, *Pinus wallichiana*, *Cedrus deodara* and *Abies pindrow* that are common while dominant shrubs of the area are *Berberis lyceum*, *Senecio flammeus*, *Daphne oleoides* and *Gymnosporia royleana*. The important herbs of this area include *Salvia nubicola*, *Thymus serpyllum*, *Iris hookeriana* and *Marrubium vulgare*. The Demoiselle cranes are reported to migrate through this area (Ahmad and Jan, 1995) and Gomal Zam Dam, Spin, Gul kauch, Laman, Dana, village Doag and Doab Kot are popular hunting sites (Fig. 1).



Fig. 1. The map showing hunting sites of demoiselle cranes in South Waziristan, Khyber Pakhtunkhwa, Pakistan.

The camping sites in south Waziristan which are more famous for cranes are Gomal zam dam, Spin,Zarmelan,

Doag and Dob kot, Laamn and Danaa. At every site there are 3-4 hunting parties and each party has 10-20 members. Each party has at least 20 decoy pairs. The hunters have a lot of facilities i.e. vehicles, tents for camping, water, food and light system and also have feeding grains for their decoys cranes.

The survey was conducted from October 2015 to February 2016, through a questionnaire performa. In total, 110 crane hunters were interviewed regarding the number of cranes hunted, age, sex and season of hunting. The proportion of cranes hunted by each hunter was also estimated. The seasonal crane hunting records from ten hunting camps at the study area were also obtained for four years (2012 to 2015). From the data collected, we calculated means and standard deviations using the following equations: $M = \Sigma X/n$ where X is the total number of cranes captured per hunting site, n is the number of hunting sites and M is the mean number of cranes captured; $SD = \Sigma X^2 / n - (\Sigma X)$; where SD is the standard deviation.

Results

The information obtained from 110 crane hunters revealed that 7947 cranes were hunted in total during the study period. The hunters captured cranes either by hand or through the use of a special device locally known as Soai. The data showed that 13 hunters (11.8%) captured the cranes (n=1850) by hand, 40 hunters (36.4%) captured by Soai (n=2642), while 57 hunters (51.8%) employed both of these methods to capture the cranes (n=3455) (Fig. 2).

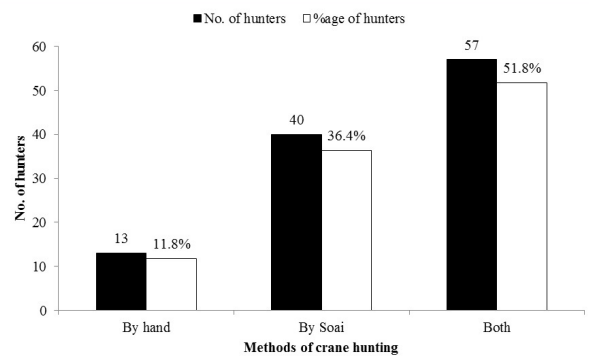


Fig. 2. Different methods used by the hunters to capture demoiselle cranes in South Waziristan tribal area of Pakistan.

Age wise segregation showed that 6624 (83.4%) of the captured canes were adults and 1323 (16.6%) were sub-adults (Table I). Among the adult cranes, 3279 (49.5%) were males and 3345 (50.5%) were females. There was

no significance difference among captured cranes with respect to sex ($\chi^2=0.66$, $p<0.05$). This sex ratio among the captured birds showed that both the sexes were equally prone to hunting.

Table I. Age composition and sex ratio of demoiselle cranes captured by the hunters in South Waziristan tribal area of Pakistan during October 2015 to February 2016.

Age class	No of cranes captured (%)
Adult	6624 (83.4%)
Male	3279 (49.5%)
Female	3345 (50.5%)
Sub-adult	1323 (16.6%)
Total	7947

A detail of distribution of cranes captured by the hunters is given in Table II. It was found that 30.3% hunters captured less than 10 cranes each. About 15% of the hunters captured 11-20 cranes each. About 13% hunters were able to capture the cranes in the range of 50-100 birds. There was one hunter who captured more than 523 cranes and another one captured 690 cranes.

Table II. No. of cranes hunted and proportion (%) of the hunters who hunted demoiselle cranes in South Waziristan tribal area of Pakistan during October 2015 to February 2016.

Range of No. of cranes	No. of hunters (%)
01-10	33 (30.3%)
11-20	16 (14.7%)
21-30	10 (9.2%)
31-40	7 (6.4%)
41-50	7 (6.4%)
51-100	14 (12.8%)
101-150	7 (6.4%)
151-200	4 (3.7%)
201-300	5 (4.6%)
301-400	1 (0.9%)
401-500	3 (2.8%)
501-600	1 (0.9%)
601-700	1 (0.9%)

The seasonal crane hunting records from ten hunting camps at the study area were obtained for four years (2012 to 2015) and the data are summarized in Table III. During

the year 2012 a total number of 1021 cranes were captured during spring season in ten camps whereas, during fall a total of 502 cranes were captured. During 2013 mean number of individuals captured during both seasons was (152.3 ± 16.5) . In 2013 a total number of 981 cranes were captured during spring season while 527 cranes were captured in fall and mean number of individuals captured during both seasons was 150.8 ± 13.2 . During the year 2014, 787 cranes were captured in spring season and 311 cranes were captured in fall and mean number of individuals captured during both seasons was 109.8 ± 13.8 . In 2015 a total of 843 cranes were captured during spring session in camps with an average of (84.3 ± 12.9) . Whereas, during fall 2015, a total of 462 cranes were captured having an average of (46.2 ± 6.5) . During 2015, mean number of individuals captured during both seasons was 130.5 ± 18.3 . These data showed that more cranes were captured in spring season as compared to fall season.

Discussion

This study revealed that crane hunting is still a popular sport and many cranes are illegally hunted in South Waziristan. Nawaz (1984) reported that people of Bannu and Lakki hunt cranes as a common sport. Only few cranes are captured by hand through the use of decoy birds while most are captured through soai. These results are in concordance with Ahmad and Jan (1995) and Shafiq (1998).

Although several studies (Roberts and Landfried, 1987; Nawaz *et al.*, 2006) in the past have reported that common cranes are also hunted in South Waziristan, Pakistan but we only found demoiselle crane and hunters reported that common cranes were extremely rare in this area suggesting excessive poaching of the species in this region along their migration routes. This has also been reported by Perveen and Khan (2010) and WWF-P (2011) that in southern districts of Pakistan demoiselle cranes are hunted in large numbers and populations of both crane species are declining due to over-hunting.

The data on crane hunting in South Waziristan are lacking but studies in other areas of Pakistan have shown that cranes are hunted in significant numbers. Ahmad and Jan (1995) estimated that 3000 to 5000 cranes were captured in Bannu and Lakki while Khan (1998) reported that 6000 cranes were hunted/captured in Kurram Valley. We found that almost 8000 cranes were captured during October 2015 to February 2016 in South Waziristan irrespective of sex and age. Such high numbers indicate that law enforcement is lacking in this area.

Our data regarding seasonal hunting records of 10 crane hunting camps for four years in South Waziristan tribal area of Pakistan showed that more cranes were

Table III. Seasonal hunting records of 10 crane hunting camps for four years (2012 to 2015) in South Waziristan tribal area of Pakistan.

Year	Season	No. of cranes captured in each crane hunting camps										Total	Mean ± SE
		1	2	3	4	5	6	7	8	9	10		
2012	Spring	70	105	143	123	145	25	128	80	72	130	1021	102.1 ± 12.4
	Fall	20	75	57	63	42	30	58	60	30	67	502	50.2 ± 5.8
	Total	90	180	200	186	187	55	186	140	102	197	1523	152.3 ± 16.5
2013	Spring	150	60	99	97	125	43	84	100	110	113	981	98.1 ± 9.7
	Fall	70	43	37	45	56	36	47	90	50	53	527	52.7 ± 5.2
	Total	220	103	136	142	181	79	131	190	160	166	1508	150.8 ± 13.2
2014	Spring	80	30	125	67	90	27	156	63	60	89	787	78.7 ± 12.5
	Fall	70	23	25	33	19	16	27	20	46	32	311	31.1 ± 5.1
	Total	150	53	150	100	109	43	183	83	106	121	1098	109.8 ± 13.8
2015	Spring	90	55	107	32	78	38	170	115	93	65	843	84.3 ± 12.9
	Fall	40	45	44	17	34	26	67	80	72	37	462	46.2 ± 6.5
	Total	130	100	151	49	112	64	237	195	165	102	1305	130.5 ± 18.3

captured during spring migration in this area. A study by Sarwar *et al.* (2013) on the diet of migratory demoiselle cranes also reported more samples obtained for analysis during spring season which suggests that crane populations are in large flocks during spring migration. However, studies on population densities of migratory cranes are crucial for effective conservation of this migratory species.

Some of the suggestions for protection and conservation of demoiselle cranes are; (i) Illegal hunting should be minimized to the extent possible through effective implementation of existing laws; (ii) Environment education and awareness of local communities should be promoted for effective crane conservation; (iii) Natural habitats and stopover grounds of cranes should be protected to the extent possible; (iv) Further research on different aspects of crane migration is highly desirable.

Statement of conflict of interest

The authors have declared no conflict of interest.

References

- Ahmad, A. and Jan, A., 1995. In: *Crane research and protection in Europe* (ed. H. Prange). Proc. 1989 Palearctic Crane Workshop; Tallinn, Estonia, pp. 337-352.
- Farooq, M., Ahmad, A. and Ghalib, S.A., 1993. *The cranes of Pakistan*. World Wide Fund for Nature, Pakistan, pp 1–54.
- Farooq, M., 1992. *Crane migration through Dera Ismail Khan (NWFP): Conservation problems and prospects*. Dissertation, Pakistan Forest Institute, Peshawar, Pakistan, pp. 1–135.
- IUCN., 2016. *Cranes*. IUCN red list of threatened species. Version 2016.4. (www.iucnredlist.org).
- Khan, A., 1998. *Cranes of NWFP*. M.Sc. thesis (unpublished). Pakistan Forest Institute, Peshawar.
- Khan, A., 2004. *Habitat status and hunting pressure on migratory cranes in Pakistan and assessment of Abi-i-Estada in Afghanistan with proposed conservation plans for selected wetlands*. M.Sc. thesis (unpublished). University of Wisconsin, Madison, pp. 70.
- Mian, A., 1981. *J. Bombay nat. Hist. Soc.*, **86**: 98-100.
- Nawaz, M., 1984. *Tigerpaper*, **11**: 17-20. <https://doi.org/10.1080/07366988409450342>
- Nawaz, M., Nawaz, Y., Malik, F.M. and Shahabuddin, M., 2006. *Zoo's Print J.*, **21**: 2333-2334. <https://doi.org/10.11609/JoTT.ZPJ.1360.2333-4>
- Perveen, F. and Khan, H.U., 2010. *Chinese Birds*, **1**: 244–250. <https://doi.org/10.5122/cbirds.2010.0021>
- Roberts, T.J. and Landfried, S.E., 1987. *Proc. 1983 Int. Crane Workshop*. pp. 139-145.
- Sarwar, M., Hussain, I., Khan, A. and Anwar, M., 2013. *Avian Biol. Res.*, **6**: 269-274. <https://doi.org/10.3184/175815513X13802893287049>
- Shafiq, M.M., 1998. *Cranes migration through NWFP: Conservation, problems and prospects*. Oriental Bird Club, pp. 1–18.
- WWF-P. 2011. http://www.wwfpak.org/sp_cranes.php