Saker Falcon breeding population estimates. Part 2: Asia

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Summary

In this paper I review current knowledge on the status of breeding Saker Falcons in the Asian part of their global breeding range. The species breeds in 10-13 different Asian countries with the greatest densities found in semi-desert, steppe and plateau habitats of Central Asian states (mainly within Kazakhstan, Russia, Mongolia and China). Overall the Asian breeding population is likely to be between 8,000-17,000 pairs, though it is believed to be declining overall. The population estimates for most Asian countries are based on very limited data and it is not possible to assess their accuracy, whilst for the remaining countries we can merely guess at the status of the species. I have reviewed previous population assessments, especially in relation to that made for the IUCN listing of the Saker as Endangered in 2004. Given the logistical problems of obtaining accurate population data for large parts of the Asian breeding range, I suggest that alternative methods such as measures of adult turnover rates and monitoring of constant areas is the best way to assess the population trends of breeding Saker Falcons in Asia. Knowledge of the breeding population status and trends is vital for successful conservation and continued utilisation of the species for falconry.

Introduction

This article follows-on from my previous assessment of the Saker Falcon breeding population in the European part of Eurasia (Dixon, 2007). By far the greater proportion of the global Saker Falcon population breeds in Asia i.e., east of the Ural Mountains, Caspian Sea and Caucasus (Baumgart, 1991). The last major review of the Saker population in Asia was conducted by BirdLife in 2004 for evaluation of the Saker's IUCN listing, which resulted in its conservation status being uplisted from 'Least Concern' to 'Endangered' (BirdLife 2008a; 2008b). For Saker Falcon population estimates and trends in the Asian part of its global breeding range the evaluation relied entirely on data presented in Potapov *et al*. (2001) and ERWDA (2003), which estimated that there were between 3200-3900 pairs of Sakers breeding in Asia (Table 1).

Country	Estimate
Russia	550-700
Kazakhstan	200
Pakistan	10
Iran	50
Iraq	60
Afghanistan	40
Uzbekistan	100-150
Turkmenistan	50
Kyrghizstan	150-200
China	1000-1200
Mongolia	1000-1200
Total	**3210-3860**

Table 1. Population estimates produced by ERWDA (2003) based mainly on presentations reported in Potapov *et al.,* (2001). The Russian total includes 110 bp that were estimated to breed in European part of the country (Galushin *et al*., 2001).

Using these estimates as the "best available information" for the status of the Saker Falcon in 2004, BirdLife assessors compared these estimates with population estimates for 1990. However, no indication was given for the source of these 1990 data, which included the following estimates: Kazakhstan (1000-3000 bp), Kyrghizstan (500-600 bp), Turkmenistan (60 bp), Uzbekistan (1000-1500 bp) and Mongolia (2668 bp). The comparison of the ERWDA estimates with these unattributed, earlier population estimates for 1990 was taken as evidence of a massive and rapid population decline, particularly in Central Asian states.

The Asian Population

The Asian range of the Saker Falcon extends across some of the most remote and difficult-to-reach areas of the world, and it includes many countries where there are few ornithologists with the resources necessary to undertake bird surveys (Dixon, 2005). Consequently, Saker breeding population estimates for range countries in Asia are scarce and those that do exist need to be carefully appraised as the estimates may be inaccurate. A population estimate produced by ERWDA (2003) for the whole of the Saker Falcon's Asian breeding range amounted to only 3,200 – 3,900 breeding pairs at the beginning of the 21st Century. For the same time period, ERWDA (2003) estimated that between 6,825-8,400 Sakers were used annually in Arabic falconry, with juvenile females comprising 77% of birds, adult females 19%, juvenile males 3% and adult males 1% (Table 2). If the average productivity of successful nests is estimated as three chicks then the trapped juvenile birds would represent the progeny of a minimum of 3250-4550 successful breeding pairs, suggesting, somewhat unrealistically, that virtually every young female Saker Falcon produced each year in Asia is trapped for use in Arabic falconry. Barton (2003)

reported that only 2.7% of wild young Saker Falcons implanted with microchips were subsequently detected at falcon hospitals in the UAE i.e., 21/478 (4.4%) juveniles from Kazakhstan and 3/428 (0.7%) juveniles from Mongolia. These two estimates (wild breeding population size and number of falcons trapped) do not sit comfortably together and one, or both, estimates must be inaccurate. The mean estimate of the number of wild Saker Falcons used in Arabic falconry in 2001 produced by ERWDA (2003) represents a significant increase in usage compared with an earlier estimate of 1,500-2,500 Sakers trapped annually in 1990-92 (data in Riddle & Remple, 1994). Both Barton (2000), for the period 1993-98, and ERWDA (2003), for the period 1993-2001, reported a decline in the usage of Sakers in the UAE.

	Female		**Male**		**Total**
	Ad	*Juv*	*Ad*	*Juv*	
Saudi Arabia	760	3080	40	120	4000
Qatar	190	770	10	30	1000
UAE	143	578	8	23	750
Bahrain	143	578	8	23	750
Kuwait	143	578	8	23	750
Total	1473	5968	78	233	7750

Table 2. Estimated number of wild-caught Saker Falcons used in Arabic falconry (using data from ERWDA (2003) and does not include an additional estimate of mortality from trapping).

If we knew the area of origin, the number used and the harvest rate for the wild-sourced Sakers that are used in Arabic falconry, we could gauge the size of the breeding population. Unfortunately, there is no reliable data on the number of wild Saker Falcons used each year, but it is likely to fall within the range of estimates produced previously of 1,500-8,400 birds. The number trapped in the wild is likely to be 5-10% higher because mortality rates are high as the birds are smuggled across international borders. We also do not know the proportion of the wild population that is trapped each year but we do know that this will vary between sexes and age classes. If we assume a 50:50 sex ratio of nestlings implanted with microchips and that 80% of microchip recoveries were of females, then data from Barton (2003) indicates that somewhere between 1-7% of female fledglings are harvested each year. A harvest of 10% to supply 1,200 juvenile females for the Arabic falconry market would indicate a 'source' population of *ca*. 11,500 breeding pairs of Saker Falcons, most of which would breed in Asia. If the number of young female Sakers used in Arabic falconry each year is much higher, as claimed by some authorities, then either (i) the harvest rate is much higher than 10% or (ii) the source breeding population is much larger than *ca*. 11,500 breeding pairs. It is not possible to determine which is true, but it is clear that the population estimates in Asia do not fit with estimated annual harvesting levels.

Afghanistan

There is no good data on the breeding population in Afghanistan. In the first half the 20th Century Sakers apparently bred commonly in the Pamir foothills of northern Afghanistan (Paludan, 1959). The Saker was reported mainly as a wintering and passage bird in the Kabul region in the early 1970's, though it was thought they also possibly bred in the mountain regions west of the capital (Smith, 1974).

It is likely that Sakers also breed (or used to breed) in regions bordering Turkmenistan and Iran where there are existing breeding populations. Many falcon trappers, often supplying Pakistani dealers, are active in the country, especially in northern, central and eastern Afghanistan.

China

The Saker breeds in northern and western China. In Xinjiang, surveys in 2005-06 of the eastern Junggar Basin found Sakers breeding at a low density of 0.09 to 0.21 bp/100 km^2. Based on the availability of suitable habitat there are probably 250-650 bp in Xinjiang. On the Qinghai-Tibetan Plateau, surveys in 2003-4 and 2007-08 found a large breeding and wintering population. The region covers some 2.5 million km^2, and a conservative breeding density estimate of 0.1 bp/100 km^2 (or 1 pair per 1000 km^2) gives a population estimate of 2,500 breeding pairs. Sakers also breed in Sichuan, Gansu, Ningxia and Inner Mongolia, and possibly Shaanxi and Heilongjiang. The overall Chinese breeding population is likely to fall within the region of 3,000 to 5,000 breeding pairs.

Saker Falcon carrying a Plateau Pika on the Qinghai-Tibetan Plateau (Photo: Ma Ming)

The Qinghai-Tibetan Plateau is undoubtedly the most important region for the Saker Falcon in China with a large breeding and wintering population. Elsewhere, Sakers breed at low density in the steppe and desert steppe of the autonomous regions of Xinjiang and Inner Mongolia. Though breeding densities are low (except for parts of the Qinghai-Tibetan plateau) the areas are huge (4.8 million km^2 in Tibet, Qinghai, Xinjiang and Inner Mongolia). In these areas of China the Saker populations are closely-linked to their favoured mammalian prey: Plateau Pika (Qinghai/Tibet), Great Gerbil (Xinjiang) and Brandt's Vole (Inner Mongolia). Government-sponsored eradication programmes for these 'agricultural pests' are carried out in each of the three regions, whilst steppe and plateau habitats are under pressure from various economic and agricultural developments. Further threats to the species include problems with electrocution on power distribution lines and trapping for falconry. Consequently, I believe that the population trend in the country is likely to be declining overall.

India

A rare migrant to the Indian subcontinent between October and April, but with summer sightings in suitable breeding habitat in Ladakh (Naoroji, 2006). The Changthang region of Ladakh is a western extension of the Tibetan Plateau where Sakers have been sighted in summer and other 'plateau' raptors, such as Upland Buzzard *Buteo hemilasius*, have been proven to breed; so it is possible a small breeding population exists here.

Iran

Formerly widely distributed as a resident breeding bird throughout much of the country but the breeding range has reportedly contracted markedly in recent years. The species has been extirpated as a breeding bird from the mountains in the centre of the country. In Khorasan province Sakers still breed in reasonable numbers in the mountainous regions bordering Afghanistan and Turkmenistan, where it is unsafe for falcon trappers and poachers to operate. In 1999 'reasonable' numbers still bred in the Hazar Masjed Mountains and in 2003 there was a good breeding population in the rugged plains of Torbet-e Jam in northeastern Iran (M. Hamedi, *In Litt*).

Iraq

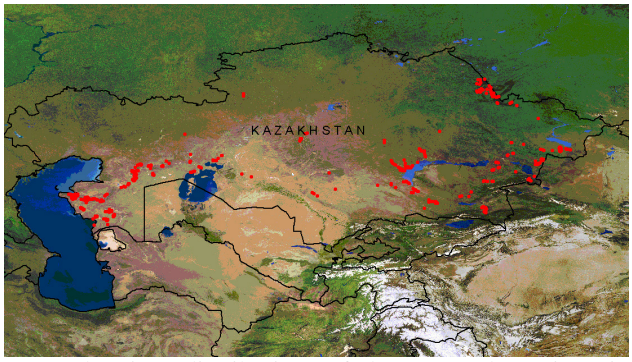
The Saker was formerly known mainly as a passage and wintering bird in Iraq, where it was prized for falconry up until the early 20th Century. It was reported to breed in the Jebel Hamrin ranges (Allouse, 1953), which extend along the Iranian border from east of Baghdad to Kirkuk, forming part of the extensive Zagros mountain chain.

Kazakhstan

Karyakin *et al.* (2005c) produced population estimates for western and northern Kazakhstan of 1349-1592 breeding pairs, whilst data from eastern Kazakhstan produced estimates of 80-150 breeding pairs in three surveyed areas (details below).

A 2006 survey for the Central Asian Important Bird Areas Project produced a population estimate of 20-30 bp of Sakers in the Kalba region of East Kazakhstan (Smelansky *et al.*, 2006). In the Pavlodar region, surveys of the forest steppe zone bordering Russia in 2005 and 2007 identified 27 breeding territories with a population estimate of 39-42 pairs in the surveyed area (Karyakin *et al.*, 2005b; Levin *et al.*, 2007). In East Kazakhstan monitoring has recorded a continuing breeding population decline over the period 2000-08 in a study area covering the Tarbagatai and Manrak Mountains and in 2008, there were an estimated 17-67 breeding pairs in the surveyed population (Levin & Dixon, 2008). The same data was used to produce a regional population estimate of 24-131 breeding pairs across eight mountain ranges covering 20,627 km^2 of Eastern Kazakhstan (Levin, 2008).

In Aqtobe, surveys of the Shagyray Plateau resulted in a population estimate of 6-8 bp in a 150 km^2 study area (Pazhenkov and Korzhev, 2006). Surveys of the Mugdzhary Mountains, in 2005-06 found evidence of recent breeding by only two pairs of Saker Falcons, indicating that the species is very rare in this region, which covers 8,900 km^2 (Karyakin *et al.*, 2007). Surveys of the Aral region estimated a breeding population of 130-245 breeding pairs (Karyakin *et al.*, 2005c). In Qaraghandy, a 2005 survey in the Ulutau region covering 20,000 km^2 resulted in a population estimate of 28-38 bp centred in the Ulutau Mountains (Karyakin & Barabashin, 2006). In Mangghystau, surveys of the Caspian-Aral region recorded 233 pairs of Sakers in 18 survey plots in 2003-04 (data in Karyakin *et al.*, 2005a).



Map showing distribution of known Saker sites in recently surveyed areas of Kazakhstan (A. Levin)

Given that no data exists for an enormous area of suitable breeding habitat in Kazakhstan, the current

breeding population of the country undoubtedly exceeds 2000 breeding pairs. For those areas where there is survey data, there are potential problems associated with the accuracy of the survey estimates due to the large size of the survey areas and with extrapolation of this data to even larger geographical regions. For example a recent paper by Levin (2008), details 19 breeding attempts found during a 36-day survey of 20,627 km^2 of mountainous terrain in Eastern Kazakhstan (an area the size of Wales). The survey involved checking sites that were known to be formerly occupied by Sakers, but it cannot be regarded as a comprehensive survey covering all breeding pairs of Sakers in this region.

Kyrgyzstan

The Saker was described as abundant in the early 20th century (Sushkin, 1908), but the population reportedly declined during the 1970's (Varobyor & Shukarov, 1985), such that by the early 1980's the breeding population of the Issyk-kul depression was given as 12-15 bp (Galushin & Pererva, 1983). In the 1980's-1990's a population of 120 individuals was estimated in an area of 6558 km^2 in the northern Alatoo Mountains, especially in the foothill steppes and mountain meadows (Shukurov & Davlyabekov, 2001). A 1998 survey of 35 known former nesting sites in the Issyk-kul region found only 5 sites occupied and illegal trapping for the falconry trade was identified as the main factor affecting the population (Gott *et al*., 2000). A wider survey in 1999 located eight nests in the Issyk-kul-Naryn area (Turganbayev *et al*., 1999), and in 2007 breeding pairs were found in the Alatoo Mountains and remote areas near the Chinese border (M. Andersen, *In Litt*). The most recent population estimate was of 100-120 bp (Shukurov & Davlyabekov, 2001).

The population estimate is based on very limited field surveys and is essentially little more than an educated guess by researchers who have some experience working on the species in the country. Following independence in the early 1990's the much diminished breeding population was further affected by falcon trapping involving locals and foreigners (especially from Syria and Pakistan).

Mongolia

The Saker Falcon breeds throughout the whole of Mongolia in mountain, steppe, forest-steppe and desert steppe zones. With over 1,000,000 km^2 of steppe, desert-steppe and forest steppe in Mongolia (Vostokova & Gunin, 2005), a conservative estimate of 0.2 breeding pairs/100km^2 produces a population estimate of >2000 bp (or 1 breeding pair/500km^2 of steppe).

Saker breeding habitat in forest-steppe of Northern Mongolia (Photo: A. Dixon)

Shagdarsuren *et al*. (2000) produced annual estimates of the Mongolian breeding population for 1998-2000 of 2823, 2961 and 2224 bp respectively. For the period 1998-2005, Gombobaatar *et al*. (2007) reported an average annual breeding density of 0.47 bp/100 km^2 (range 0.13 to 0.97 bp/100 km^2) within several study areas of the Mongolian steppe zone. In the steppe zone of central Mongolia the breeding density of Saker Falcons varies spatially in relation to the availability of nest sites and temporally in relation to food supply. In three mountain block survey areas of 36, 236 and 240 km^2 the combined Saker breeding density in 2006-07 was 5.5 bp/100km^2 (range 4.2 to 16.7 bp/100 km^2; Dixon *et al*. unpublished data). Elsewhere in central Mongolia, in the 499 km^2 Khustain Nurru Nature Reserve, where grazing is strictly controlled, there are only three regular breeding pairs of Sakers i.e., 0.6 bp/100km^2 (D. Usukhjargal).

In a 2005 survey of *ca*. 1,500 km^2 of flat steppe habitat four breeding pairs of Sakers were found utilising man-made structures such as buildings for water wells and livestock shelters, giving a breeding density of 0.3 bp/100 km^2. In my opinion, estimates within the range of 0.1 to 0.3 bp/100 km^2 are likely to accurately reflect Saker breeding densities in flat steppe habitats. Man-made structures provide nesting sites for Sakers in flat landscapes allowing the species to breed in such habitats (Ellis *et al*., 1997; Potapov, 1999), though Sakers have been recorded breeding on flat ground (Potapov *et al*., 2001). In order to estimate the Saker population in the steppe zone of Mongolia, an area of 406,700 km^2 comprising both flat and hilly landscapes, I have estimated that Sakers breed at a density of 0.2 to 0.5 bp/100 km^2. For the forest-steppe and desert steppe zones (covering 344,100 and 328,500 km^2 respectively) the breeding density is likely to be somewhat lower, at an estimated 0.1 to 0.3 bp/100 km^2. This gives a population estimate of between 1400-4100 breeding pairs.

Potapov *et al*., (2002) reported that there was *ca*.

estimated that 1100 Sakers bred on poles of the electricity transmission and distribution network. In the steppe zone in 2006 Sakers were breeding at a density of 5.27 bp/100 km of electricity transmission line (171 km surveyed) and 2.94 bp/100 km of distribution line (102 km surveyed; Dixon *et al.* unpublished data). There are over 4000 km of electricity transmission lines in central Mongolia, which potentially supports *ca.* 210 breeding Sakers. The length of electricity distribution lines in central Mongolia is not known, but is estimated to be of approximately the same length as the transmission lines and could possibly support a further 120 breeding pairs. The breeding density of Sakers in the remaining 24,000 km of power line is likely to be lower than that found in the power lines crossing the predominantly flat, steppe landscape of central Mongolia, and I estimate that in Mongolia 400-500 pairs of Saker Falcons breed on electricity power lines.

Young Saker in an old Raven's nest on an electricity pylon in central Mongolia (Photo: A. Dixon)

Combining the breeding density estimates provided above with the estimates for Sakers breeding on power lines I estimate that the Mongolian breeding Saker Falcon population probably lies within the range of 2,000 to 5,000 breeding pairs.

It is not possible to accurately assess recent population trends across the whole of Mongolia, though Gombobaatar *et al.*, (2007) reported a fluctuating but overall stable population for the period 1998-2005. Surveys from 2005-08 indicate a stable breeding population in the central Mongolian steppe (A. Dixon and N. Batbayar, *Unpub. Data*), whilst an experimental study to artificially increase the breeding population indicates that a large non-breeding population exists in nest-site limited steppe areas (Dixon *et al.*, 2008).

The population estimates of Shagdarsuren *et al.* (2000) were based on extrapolation from five survey areas totalling 16,948 km^2 i.e., 1.1% of Mongolia. However, the vast size of the survey areas meant that coverage was incomplete and thus the recorded breeding densities within the survey areas were minimum estimates, averaging 0.2 bp/100 km^2. The breeding density data presented by Gombobaatar *et al.* (2007) is derived from the same survey areas reported by Shagdasuren *et al.* (2000), though the latter authors refrained from using this data to estimate the national breeding population. It is important to note that the selection of these survey areas was not random. In the steppe, desert-steppe and desert zones of Mongolia there are few suitable nesting sites for Sakers away from mountains, thus it is not possible to extrapolate from the breeding densities recorded in mountain areas to much larger landscape regions that include flat or rolling featureless plains. Consequently, I have used density estimates from recent intensive surveys of smaller study areas in central Mongolia that have been scaled-up to produce an overall breeding density estimate for the steppe zone of Mongolia i.e., 0.2 to 0.5 bp/100km^2. However, the population estimate I have provided is very sensitive to the breeding density estimates as a small increase of 0.1 bp/100 km^2 adds over 1000 breeding pairs of Saker Falcons to the national population estimate!

Pakistan

A scarce winter visitor, mainly to the mountains and foothills of Baluchistan and the North West Frontier Provinces (Naoroji, 2006). Possibly breeds (or formerly bred) in the mountainous areas of the North West Frontier Provinces.

Russian Federation (Asian part)

In Asiatic Russia the Saker Falcon breeds in the southern Siberian regions of Chelyabinsk, Kurgan, Tumen, Omsk, Novosibirsk, Kemerovo, Krasnoyarsk and Chitin, the Altai Territory, the Republics of Altay, Tuva, Khakasia and Buryatia. The breeding population of Sakers in these areas was assessed by Karyakin *et al.* (2004; 2008). The regions of Cheylabinsk to Novosibirsk, covering the border region with Kazakhstan from the Urals and the Ob River, were estimated to support 80-125 breeding pairs, mostly in patches of steppe within pine forests. The Altai-Sayan region was estimated to support a further 1700-2250 breeding pairs, with significant concentrations in the Ubsu-nur and Tuva depressions, and in the Altai Mountains. In Buratia, in the steppes surrounding Lake Baikal, it was estimated that there are a further 135-165 breeding

pairs (Karyakin *et al*., 2006). In south-eastern Siberia the status of the Saker is poorly known though the species probably breeds in southern areas of the Chitin region bordering Mongolia and in Ussuriland (Kuryukov, 2002). Karyakin (2008) produced a recent population estimate for the whole of Russia of 1854-2542 breeding pairs in 2007, further noting severe declines in European Russia and smaller declines in the main population centre in central Siberia.

The population estimates derived by Karyakin and his co-workers result from field surveys of large study plots across a vast swathe of southern Siberia, from the Urals in the west to Lake Baikal and beyond in the east. The accuracy of the Saker counts within the study plots, which averaged *ca*. 5000 km^2 for six of the plots in the Altai-Sayan region, is not known. With such large survey plots and limited time the risk of under-recording must be high. Breeding density measures from the study plots were then extrapolated across a wider area, taking into account the relative proportions of various habitat types. However, when extrapolating over such large areas account must be made for regional variation in breeding densities within similar habitat types. Despite my caveats relating to under-recording and problems of extrapolation, the surveys undertaken by Igor Karyakin and his co-workers represent a phenomenal effort given the size of the Saker breeding range across southern Siberia.

Tajikistan

In the first half of the 20th Century the species was recorded breeding at low densities in river valleys and mountain areas in the western half of Tajikistan (Ivanov, 1940). Later reports indicated that the Saker has a widespread distribution over this mountainous country but are generally scarcer in the high Pamirs of the east than in the mountains and river valleys of the west (Abdusalyamov, 1971). In the 1990's falcon trapping by locals and foreigners (especially Syrian nationals) was widely practiced, mainly targeting autumn passage birds though some young were also taken from nests (M. Roustain, *In litt*)

Turkmenistan

An assessment published towards the end of the 20th Century reported that Sakers were widely distributed in the country with the main breeding areas being the mountains and foothills of the Kopet Dag bordering Iran, hills in the central Karakum Desert, the Usturt Plateau, the Badhyz region close to the Afghanistan border and the mountain foothills of the far east, with a population estimate of 150 bp in the late 1990's (Saparmuradov, 1999). There is not enough data available to assess the accuracy of this population estimate or to determine recent population trends. Uncontrolled trapping for the falconry trade and habitat loss are cited as factors affecting the Saker population in Turkmenistan (Saparmuradov, 1999).

Uzbekistan

The Saker is widely distributed across the country, breeding along the southern and eastern escarpments of the Usturt Plateau, the Kyzylkum Desert, the Bukantau Mountains of central Uzbekistan through the Naratau to the Zarev Mounatin ridge in the southeast and in the Talass Mountains of the north east (Mitropolsky *et al*., 1987). Breeding numbers apparently increase when rodent populations are high and Sakers have bred on electricity pylons since the mid 1970's in the plains of the Kyzylkum Desert. The breeding population has been estimated as 100-150 bp (Kreuzberg-Mukhina *et al*., 2001). Following the break-up of the Soviet Union many people resorted to trapping falcons to obtain an income, encouraged by reports of the high prices they fetched, though this high level of indiscriminate trapping had diminished by the late 1990's (E. Kreuzberg-Mukhina, *In litt*). During the 1990's many falcon trappers from Pakistan were also active in Uzbekistan (S. Zinovyev & E. Peregonstsev, *In litt*).

Country	Population Estimate	Date of Estimate	Data Quality*	15 Year Trend
India	0-10	2006	D	Unknown
Iran	10-100	NA	E	Unknown
Iraq	0-50	NA	E	Unknown
Kyrgyzstan	100-120	2001	D	Declining
Uzbekistan	100-150	2000	D	Declining
Russian Federation	1500-3000	2007	C	Declining
Turkmenistan	100-150	NA	E	Unknown
Tajikistan	10-100	NA	E	Unknown
Afghanistan	10-100	NA	E	Unknown
Pakistan	0-50	NA	E	Unknown
Kazakhstan	2000-3000	2008	C/D	Stable/Declining
Mongolia	2000-5000	2008	D	Stable
China	3000-5000	2008	D	Declining
Total	**8840-16830**	**NA**	**C-E**	**Declining**

Table 3. Asian Saker Falcon population estimates by country (breeding pairs). Population trend data relates to the 15-year period prior to the estimate.
* Data quality scores for the population estimates are based on the following criteria: **A** = excellent, quantitative data available with precision estimates based on comprehensive survey work; **B** = good, quantitative data available, based on extensive field work; **C** = medium, quantitative data available, based on limited field work; **D** = poor; no quantitative data available and limited field surveys; **E** = No data, guess.

Discussion

Our knowledge of Saker Falcon breeding populations in much of Asia is still incomplete; nevertheless current information indicates that the population is much larger than previously thought. This is especially true for Kazakhstan where the population is at least ten times larger than the previous estimate (≥ 2000 *cf.* 200 bp). This is not due to a massive increase in the population of Kazakhstan in the last seven years, but is the result of an erroneous estimate which stated that "the total population in Kazakhstan is estimated at no more than 150-200 pairs" (Levin, 2001). We know now that in some parts of Kazakhstan the breeding population is stable (e.g., forest steppe of northwest) whereas in other areas it is declining (e.g., eastern Kazakhstan). The highest breeding densities are found in western Kazakhstan but we know nothing of the population trend in this region.

Overall, the 15-year trend data indicates that the Asian Saker Falcon is declining, though evidence for any decline is circumstantial for China, which is potentially the country with largest breeding population. Evidence for a population decline in Russia is based on data from surveys led by Igor Karyakin, who has monitored Sakers across a huge area for over 10 years and is in a unique position to be able to assess the recent population trend of the species. In Mongolia, the breeding population of the central steppe zone is at least stable and is limited by the availability of nest sites, but for other parts of the country there is no good data on the status of the species. We are unlikely to ever get good, accurate population measures with confidence intervals for any Saker populations in Asia (no such estimate is even available for any European country). There is little value in trying to compare a modern, but vague population estimate with an older, even 'vaguer' population estimate! We need to look at alternative ways of determining population trends, such as using measures of breeding population turnover rates and/or accurate population monitoring of constant study plots. The establishment of a monitoring system in key areas of the global breeding range is essential if the conservation status of the Saker is to be accurately assessed (for the best use of scarce conservation resources) and if falconers wish to harvest wild-sourced birds in a demonstrably sustainable manner. There are opportunities to support conservation through wise and sustainable use but it requires a change in the mind set of those who seek total protection for the species from exploitation and from those who exploit the wild population with no thought on its impact.

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