

UDC: 598.279.24:591.543.4 (477)

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JUVENILE DISPERSAL OF SAKER FALCONS IN UKRAINE ACCORDING SATELLITE TELEMTRY

Saker Falcon (Falco cherrug) is a partial migrant species. The data of its migration on the territory of Ukraine have been limited so far. In 2011 in the south of Ukraine 8 juvenile Saker Falcons were fitted with satellite transmitters. For this 22g solar ARGOS/GPS PTTs-100 transmitters were used. Two males stopped sending signals within a few days after tagging. After leaving their eyries young birds left nesting territory in 30-64 days (on average - 44). Juvenile dispersal of different birds began in a period between July, 8 to August, 5 (on average – July, 23). During the first dispersal the birds flew east and northeast from the natal eyrie. These movements were up to several hundred kilometers and lasted from 2 to 10 days, after which the birds returned to the place of temporary settlement located in the Crimea. In one case their placing coincided with the nesting territory, in the other four cases they situated in 20-290 km. In August a juvenile male roamed from the Crimea to Cyprus. Of the three birds that lived up to winter all three spent the winter at the previously selected areas not showing migratory behaviour. In June a one-year-old juvenile male headed northeast to the western Kazakhstan, about 400 km north of the Caspian Sea, and in two months returned to the Crimea.

Key words: Saker Falcon, migration, satellite tracking, Ukraine

Problem-setting, analysis of recent publications. The Saker Falcon (*Falco cherrug*) is included in the IUCN Red List (category EN – globally endangered species). It is protected under the terms of the Bonn Convention, Bern Convention, CITES, and listed in all editions of the Red Data Book of Ukraine (1980, 1994, 2009).

To date, there are two different populations of Sakers in Europe, separated by the Carpathian Mountains: the Central European population (with the vast majority of pairs nesting in Hungary, Slovakia and Serbia, and with a few pairs in the Czech Republic, Austria, Croatia and western Romania) and the East European population (with the population centre in Ukraine, and with a few pairs in Moldova and eastern Romania). Both populations are estimated to hold a maximum of 400 pairs. The Sakers, nesting in Ukraine, form a nucleus of the Central European population. Assessment of their number differs: at least 250-300 pairs [3], 280-325 pairs [4], 350-400 pairs [2].

The Saker Falcon is a partial migrant: some birds are sedentary and others migrate seasonally. Until recently, the ringing had been a main method to study the species migration and resulted in a general understanding of movements of the Central European birds [6]. Up to date, there was only one recovery from Ukraine and thus ringing did not provide sufficient information about the species migration. In conservation projects between 2007 and 2010, 53 Saker Falcons were tagged with satellite transmitters (Reference: <http://sakerlife2.mme.hu/sites/default/files/Aquila-119-110-Prommer.pdf>). As a result, the unique data were received on the movements of Sakers from the Central European population [5, 7, 8].

Material and Methods

In 2011, we tagged 8 juvenile Sakers in Ukraine (5 males and 3 females): 3 males and 3 females in the Crimea and 2 males in Kherson Region. Solar powered, satellite-received transmitters (PTT) were used manufactured by Microwave Telemetry Inc. This type of transmitters enable researchers to located the birds with an accuracy of a few meters using Argos satellite system (www.argos-system.org) for communicating data.

Juveniles were taken from the nests just before they were ready to fledge. The birds were treated as carefully as possible that prevented any harm from the tagging procedure.

All of the units mounted on the birds with a harness were manufactured of tubular Teflon ribbon. Harnesses were tailor-made to adjust the individual. Finishing was made by using dental floss and super glue [7]. All birds were tagged in their eyrie. Tagged juveniles were returned to the nest immediately.

Results

Two males in Kherson Region stopped sending signals within a few days after tagging for some unknown reason. One of them had left the eyrie by that moment. All the remaining 6 birds continued transmitting in the subsequent months. For further analysis the data from these 6 individuals were used.

Juveniles fledged in the first –second decade of June (02, 05, 07, 08, 09, 11 and 16 June correspondingly), 10 June on average.

As data show, juveniles remain in the natal eyries for about one and a half months after fledging. This is the time they need to collect basic knowledge for their survival. Some birds, however, leave the parental eyries sooner – about one month after fledging.

The six tagged juvenile Sakers stayed in their natal eyries 30 to 64 days (30, 32, 43, 46, 49, 64 days respectively), 44 days on average. Therefore, the age of Crimean Sakers starting the post-fledging dispersal is similar to that of the Central European juveniles [8].

The birds start the post-fledging dispersal between 8 July and 5 August (08.07, 19.07, 22.07, 22.07, 31.07 and 5.08 respectively), 23 July on average. The first dispersal of all birds was to the east/northeast from the natal eyrie. These first dispersal movements covered several hundreds kilometres and took 2 to 11 days (2, 4, 5, 5, 5 and 11 days respectively). After that the juveniles returned to their TSAs, staying there until the autumn migration or wintering period. Two of the birds flew around the Azov Sea but returned to the Crimea. The farthest dispersal place for the third bird was Rostov Region, for the fourth – Taman Peninsula, the fifth reached Kharkiv Region and the six – Zaporizhzhia Region. After that all of them returned to the Crimea. The length of these post-fledging movements amounted 497, 936, 1039, 1195, 1372 and 1973 km respectively, and 1169 ± 183 km on average. The maximal directed distances from the natal eyries were 217, 356, 407, 445, 474 and 510 km (401 ± 45 km on average).

One of the six Sakers returned to its parental area, and another bird perished near Syvash on the way to its natal eyrie. Other four birds stayed in the TSAs somewhat distant from their natal eyries – 20 km away (dispersal within the limits of Tarkhankut Peninsula, Crimea), 120 km (from the western Crimean natal eyrie the bird roamed to Kherson Region), 130 km (from the natal eyrie on Kerch Peninsula the bird roamed to the Syvash area), 290 km (from the natal eyrie on Kerch Peninsula to Tarkhankut Peninsula). Therefore all the six juvenile birds established TSAs in the Crimea during the dispersal time. Soon, one of them flew to Kherson region where stayed for long in a new TSA. Similar results were obtained for the Central European juveniles – usually one or several TSAs were used before the autumn migration [8].

According to the data, Crimean Sakers did not disperse to the west as far as to reach the range of the Central European population. The sample size, however, was too low and it was not possible to exclude the possibility that the Eastern European Sakers reached Central Europe.

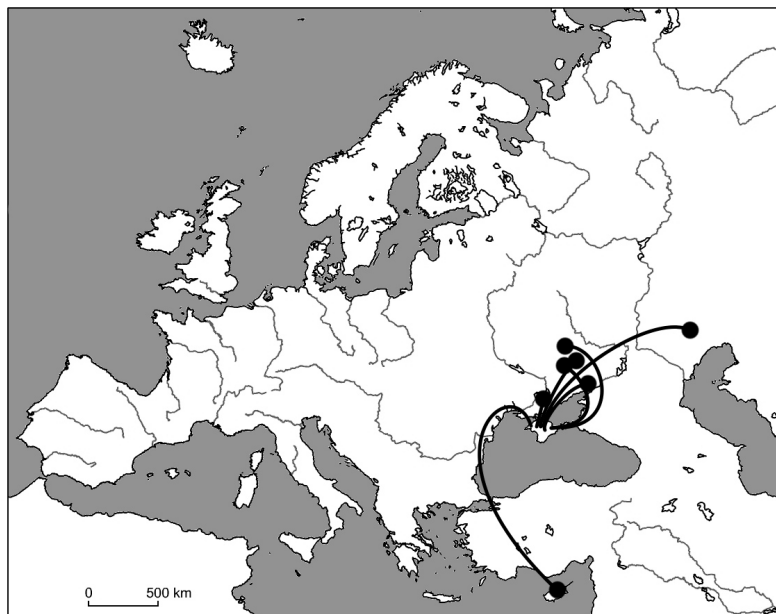


Figure. Main direction of long range post-fledgling dispersal and movements of Ukrainian satellite tracked juvenile Sakers of the second calendar year (black circles show the farthest place after dispersing from the natal eyrie).

In late summer (since 6 August), a juvenile male roamed to Cyprus from the Crimea and crossed Turkey. Having stayed on the island for only 4 days, he returned to the mainland Turkey and was electrocuted in September.

One male perished in a temporary staging area (TSA) on Tarkhankut Peninsula (Crimea) in late October.

Therefore, among 5 birds, which survived to the autumn migration period, only one male made a long range flight to Cyprus in the Mediterranean. The length of his 33-day migration equalled 2930 km, and the distance from the natal eyrie to the farthest place of his migration was 1240 km.

Only three birds survived to winter (two males and a female). Two of them wintered in the Crimea, the third one – in Kherson region, all of them in previously selected TSAs. These data on the Saker wintering areas were rather unexpected for us, as according to our observation the Saker Falcon was a rare wintering species of southern Ukraine [1]. In the Central European population about a half of the first calendar year birds spend winter in the Pannonian Basin, while others migrate [8].

One male survived to the spring season, other two birds perished from severe winter 2011/2012 (or transmitters has been broken). This juvenile male spent winter in the Crimea, and started to roam northeast in the beginning of June. In 7 days he reached the West Kazakhstan Region (Kazakhstan), about 400 km north of the Caspian Sea. The direct distance from his natal eyrie was 1260 km. There, on a rather limited area in a semi-desert, the bird staged for two months and returned to his former Crimean grounds in mid August. He perished (or transmitters has been broken) in the Crimea in late January 2012 being of the second calendar year.

Discussion

As the data suggest, the dispersal range of Crimean Sakers is less then that of the Central European birds, and the main direction of dispersal is similar to their western counterparts: east/northeast [5, 6, 8]. This decreases the likelihood that Crimean Sakers reach the western Saker population. Only a few percent of the 1 cy and 2 cy Sakers of the Central

European population visit Eastern Europe during their post-fledging dispersion or summer roaming of 2 cy birds. A vast majority of the Central European birds, that visited Eastern Europe, perished or returned to their natal eyries [6].

Although it must be noted that these data are based only on the movements of six birds and all of them were tagged in a well-defined geographical area (Crimea). Information on more Sakers tagged in a wider geographical area (e.g. throughout southern Ukraine) may give different results. The relations between the Crimean and the mainland Ukrainian populations are yet to be understood as well.

Summarized results of the research allow drawing a conclusion that juvenile Sakers demonstrate different behaviour in the post-fledging period. All juveniles have post-fledging dispersal and form temporary staging areas which predominantly do not coincide with their natal eyrie. In half of these cases the TSAs are also used as wintering sites. Some birds demonstrate a tendency towards long range flights up to 3000 km.

Our study has not confirmed the occurrence of cross-breeding and gene exchange between the Central European and the East European Saker populations. Although, by to-date we have known a case of the Saker hatched in Romania and then nested in the Crimea (reference: <http://sakerlife2.mme.hu/en/content/romanian-saker-breeds-crimea>). However, based on the results of ringing and satellite-tracking in Central Europe and this recent study in Ukraine, it was an extremely rare event, and there is not significant gene exchange between the two populations. The high level of individual's philopatry and the distance between the ranges of the two populations prevent the regular and significant gene exchange.

Earlier, the two separated populations formed a continuous population, spanning from the Morava valley across Hungary, northern Serbia, northern Bulgaria and southern and eastern Romania to southern Ukraine and the European part of Russia. While in such a continuous population, gradual – step-by-step – spreading of new genes was possible, now it is unlikely that new genes can regularly spread from one population to the other.

In conservation practice, these results also mean that a growing Central European Saker population, at least on its current level of abundance, will not actively contribute to the decreasing East European population. Instead of direct impact, therefore, the Central European population may have an effect on the East European population if it will be able to expand gradually and the Sakers re-conquer the former northern Bulgarian and southern Romanian habitats in the coming decades. Therefore, local conservation measures focusing on the existing core breeding areas and their edges, as well as conservation measures on the former and thus potential breeding grounds are the keys to bring back the species to its ancient range.

Conclusions

Basing on the received data we can conclude as follows:

1. Saker juveniles fledged in the first –second decade of June, 10 June on average;
2. juveniles stayed in their natal eyries 30 to 64 days, 44 days on average;
3. the post-fledging dispersal started between 8 July and 5 August, on average 23 July;
4. the first dispersal of all birds was to the east/northeast from the natal eyrie. These first dispersal movements covered several hundreds kilometres and took 2 to 11 days. After that the juveniles returned to their TSAs;
5. all the six juvenile birds established their first TSAs in the Crimea. Their location for each of the bird varied – from overlapping the natal eyrie to 290 km away;
6. only one male demonstrated long range dispersal in August-September and reached Cyprus;

all the three Sakers, survived to winter, stayed for the winter in previously selected areas thus demonstrating a settled way of life;– one male of the 1st cy made long range flight in June to the northern Kazakhstan but returned to its natal eyrie.

– the data obtained do not confirm the occurrence of gene exchange between the Central European and the East European Saker populations of Sakers.

Acknowledgements. We would like to thank our colleagues without whom we would have not been able to accomplish this research: Saker LIFE project manager J. Fidló or transmitters has been broken czky for his active participation in supplying transmitters for the tagging of birds; assistant professor V. Strigunov (Kryvyi Rih National University); Sz. Daróczi (Milvus Group, Romania) and H. Török (Bükk National Park Directorate, Hungary) for their contribution in field works.

References

1. Gavrilyuk M.N., Domashevsky S.V., Vetyrov V.V. Results of winter counts of birds of prey in the central part of the Crimean Peninsula in 2010 // *Birds and Environment: Collection of scientific papers* / Ed. by Rusev I.T., Stoylovsky V.P., Korzyukov A.I., Kivganov D.A. – Odessa: April, 2013. – P.52-58. In Russian: Гаврилюк М. Н., Домашевский С. В., Ветров В. В. Результаты учетов зимующих хищных птиц в центральной части Крымского полуострова в 2010 г. // *Птицы и окружающая среда: Сб. научных работ* / Под ред. Русева И.Т., Стойловского В.П., Корзюкова А.И., Кивганова Д.А. – Одесса: Апрель, 2013. – С. 52-58.
2. Milobog Yu.V., Vetrov V.V., Strigunov V.I., Belik V.P. The Saker (*Falco cherrug* Gray) in Ukraine and adjacent areas // *Branza: Transactions of the Azov-Black Sea Ornithological Station*. – 2010. – Issue 13. – P. 135-139. In Russian: Милобог Ю. В., Ветров В. В., Стригунов В. И., Белик В. П. Балобан (*Falco cherrug* Gray) в Украине и на сопредельных территориях // *Бранца: Сб. научн. тр. Азово-Черноморской орнитолог. станции*. – 2010. – Вып. 13. – С. 135–159.
3. Mylobog, Yu.V. Saker Falcon // *Red Data Book of Ukraine. Animal World* /Edited by I.A.Akimov. - Kyiv, Globalkonsalting, 2009. - P. 436. In Ukrainian: Милобог Ю. В. Балабан // *Червона книга України. Тваринний світ* / За ред. І. А. Акімова. – К.: Глобалконсалтинг, 2009. – С. 436.
4. Milobog Yu.V. Falconiformes of the steppe zone of Ukraine: species composition, territorial distribution, abundance dynamics and protection: Theses for the degree of Candidate of Biological Sciences: 03.00.08/ Schmalhausen Institute of Zoology – Kyiv, 2012. – 24 p. In Ukrainian: Милобог Ю.В. Соколоподібні (Falconiformes) степової зони України: видовий склад, територіальний розподіл, динаміка чисельності та охорона: Автореф. дис... канд. біол. наук: 03.00.08 / Інститут зоології ім. І.І. Шмальгаузена. – К., 2012. – 24 с.
5. Gamauff A., Dosedel R. Satellite telemetry of Saker Falcons (*Falco cherrug*) in Austria: juvenile dispersal at the westernmost distribution limit of the species // *Aquila*. 2012.- Vol. 119. - P. 65–78
6. Prommer M., Milobog Yu., Gavrilyuk M., Vetrov V., Bagyura J. Relationship between the Central and East European Saker falcon populations based on results of ringing schemes and satellite-tracking // *Хищные птицы в динамической среде третьего тысячелетия: Тр. VI Междунар. конф. по соколообразным и совам Северной Евразии, г. Кривой Рог, 27–30 сентября 2012 г.* – Кривой Рог: Изд. ФЛ-П Чернявский Д.А., 2012. – С. 434–445.
7. Prommer M. et al., 2010: Satellite-tracking Sakers (*Falco cherrug*). – Evaluating Sakers' post-fledging dispersal, migration, roaming and habitat use from a conservation point of view. Closing conference of the project LIFE06 NAT/HU/000096 «Conservation of *Falco cherrug* in the Carpathin Basin». – Bükk National Park Directorate, Eger, Hungary. Link: http://sakerlife.mme.hu/uploads/File/Saker_Conference_Abstracts.pdf
8. Prommer M., Bagyura J., Chavko J., Uhrin M. Migratory movements of Central and Eastern European Saker Falcons (*Falco cherrug*) from juvenile dispersal to adulthood // *Aquila*. – 2012. - Vol. 119. - P. 111–134.

Анотація. Проммер М., Милобог Ю.В., Гаврилюк М.Н., Ветров В.В. Дисперсія молодих балабанів в Україні на основі результатів супутникового стеження. Балабан (*Falco cherrug*) є видом, для якого характерна часткова міграція. Відомості щодо його міграції на території України до теперішнього часу були обмеженими. У 2011 р. на півдні України було помічено супутниковими передатчиками 8 молодих балабанів. Використовували 22-ти граміві передатчики ARGOS/GPS PTTs-100 з сонячною батареєю. Від двох самців сигнали перестали надходити через декілька днів після мічення. Молоді птахи залишили гніздову територію через

30-64 днів (у середньому 44) після вильоту з гнізд, післягніздова дисперсія почалася у різних птахів з 08 липня до 05 серпня, в середньому 23 липня. Перший післягніздовий розліт усіх птахів відбувався на схід/північний схід від гнізда, ці переміщення були протяжністю по декілька сотень кілометрів та тривали від 2 до 10 днів, після чого птахи верталися в місця тимчасового мешкання, які були розміщені в Криму. Їх розташування в одному випадку співпадало з гніздовою територією, у чотирьох других було на відстані 20-290 км. Один самець здійснив протягом серпня – вересня дальні переміщення, досягнувши Кіпра. Із трьох птахів, що дожили до зими, всі залишилися зимувати на раніше обраних територіях, демонструючи осілість. Самець у віці близько одного року в червні здійснив переміщення в західний Казахстан, після чого повернувся в район гніздування.

Ключові слова: балабан, міграція, супутникова телеметрія, Україна

Аннотація. Проммер М., Милобог Ю.В., Гаврилюк М.Н., Ветров В.В. Дисперсія молодих балабанов в Україні на основі результатів супутникового слєження. – Балабан (*Falco cherrug*) являється видом, для котрого характерна частичная міграція. Данніе о его міграції на території України до настоящего времени были ограниченными. В 2011 г. на юге Украины было помечено спутниковыми передатчиками 8 молодых балабанов. Использовали 22-ти граммовые передатчики ARGOS/GPS PTTs-100 с солнечной батареей. От двух самцов сигналы перестали поступать через несколько дней после мечения. Другие Молодые птицы оставили гнездовую территорию через 30–64 дней (в среднем 44) после вылета из гнезд, послегнездовая дисперсия началась у разных птиц с 08 июля по 05 августа, в среднем 23 июля. Первый послегнездовой разлет всех птиц происходил на восток/северо-восток от родных гнезд; эти первые перемещения были протяженностью по несколько сотен километров и длились от 2 до 10 дней, после чего птицы возвращались в места временного обитания, которые были расположены в Крыму. Их размещение в одном случае совпадало с гнездовой территорией, в четырех других было на расстоянии 20–290 км. Один самец осуществил на протяжении августа – сентября дальние перемещения, достигнув Кипра. Из трех птиц, доживших до зимы, все остались зимовать на ранее избранных территориях, демонстрируя оседлость. Самец в возрасте одного года в июне осуществил дальнейшее перемещение в западный Казахстан, после чего вернулся в район гнездования.

Ключевые слова: балабан, міграція, спутникова телеметрія, Україна

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Arrived 12.11.2014
Approved 07.12.2014