ЕРСУЛТАНОВА, З.П., АЙТЕНОВА., А.А.

MS ACCESS 2007 БАҒДАРЛАМАСЫН КІТАПХАНА АҚПАРАТТЫ МӘЛІМЕТТЕР ҚОРЫН ЖАСАУ ҮШІН ҚОЛДАНУ

Мақалада Access компьютерлік бағдарламасын қолданып, кітапхана деректер қорын жобалау сөз етіледі. Деректер қорының практикалық маңыздылығы көрсетіліп, қолданушыға ыңғайлы ақпараттық программалық құрал жасалады. Деректер қоры компьютер жадысында сақталып, жаңартылып отырады және қолданушыға программаның батырмалы формасы деректер базасын басқаруды жеңілдетеніні жазылған.

Мақаланың мәнін ашатын сөздер: *ақпараттық құзыреттілік, модель, педагогикалық шарттар.*

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ИСПОЛЬЗОВАНИЕ ПРОГРАММЫ MS ACCESS 2007 ДЛЯ СОЗДАНИЯ БАЗЫ ДАННЫХ ДЛЯ БИБЛИОТЕКИ

В статье рассматривается создание базы данных библиотеки с использованием программного обеспечения Access. Показана практическая значимость базы данных и разработана удобная для пользователя информационная программа. База данных хранится и обновляется в памяти компьютера, и управлять базами данных пользователю легко благодаря удобному интерфейсу кнопочной формы программы.

Ключевые слова: *информационная компетентность, модель, педагогические условия.*

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LOOP MIGRATION LENGTHENS TRAVEL DISTANCE AND INCREASES POTENTIAL RISKS FOR A CENTRAL ASIAN, LONG-DISTANCE, TRANS-EQUATORIAL MIGRANT, THE RED-FOOTED FALCON

Abstract

Geolocator, ringing and observational data together demonstrate that Red-footed Falcons from northern Kazakhstan have a clockwise loop migration that begins with a long and unusual westward trek around eastern Europe's large inland seas before continuing to extreme southern Africa. Return migration is farther west and requires crossing two major migratory barriers: the Sahara and the Mediterranean.

The loop migration we describe requires an extensive longitudinal movement, exposes central Asian Red-footed Falcons to multiple desert, mountain and marine crossings, and, at outbound and return Mediterranean bottlenecks, crosses sites where raptor shooting is common.

Keywords: *Red-footed Falcon, geolocator, Kazakhstan, loop migration.*

1. Introduction.

Conservation of migratory birds is challenging because it must occur on summer breeding grounds, on wintering grounds, and on migration (Faaborg et al. 2010). Furthermore, the vast majority of research or conservation action for northern hemisphere migrants has occurred on either their summering (Vickery et al. 2014) or wintering (Keast & Morton 1980) areas. However, it is generally well understood that for many species, the vast majority of deaths occur during poorly known migration periods (Newton 2008, Klaassen et al. 2014).

In the absence of human activity, mortality on migration is generally associated with the problems of long-distance flight, predation, and the requirement to husband energetic resources to allow successful crossing of large barriers and arrival at wintering or summering locations in suitable condition to survive and to breed (Newton 2008, Klaassen et al. 2014). Many large birds, including raptors, face additional anthropogenic risk when on migration, especially from shooting (Pannuccio 2005). For example, every year thousands of raptors are shot when passing via the island nation of Malta (Fenech 2010). Other hotspots of shooting of migratory raptors are on the eastern Black Sea coast (Vansteelant et al. 2014), the Republic of Georgia (van Maanen et al. 2001), Lebanon, northern Syria and elsewhere in the Mediterranean (Magnin 1991, Bildstein et al. 1993).

Some long-distance migrants follow a similar trajectory for both their autumn and their spring movements (Miller 2012). However, many others follow an elliptical or “loop” strategy, using different outbound and return routes. To date, loop migration has been recorded for ≥2 North American raptor species (Kerlinger 1989, Martell et al. 2014) and ≥7 Eurasian raptors (Meyburg et al. 2003, Corso and Cardelli 2004, Bildstein 2006, Klaassen et al. 2010, Agostini et al. 2011, Limiñana et al 2012, Mellone et al. 2013a,b). In fact, recent work has suggested that loop migration may be the rule for Palearctic migrants faced with the dual barriers presented by the Mediterranean and the Sahara (Schmaljohann et al. 2012, Klaassen et al 2014). The evolution of loop migration is likely tied to adaptive wind drift (Alerstam 1990, Klaassen et al. 2011) and the improved odds of surviving difficult barrier crossings when weather makes them seasonally more or less challenging.

The globally threatened Red-footed Falcon (*Falco vespertinus*) breeds across European steppes, from Hungary through Kazakhstan and winters in southern Africa (Ferguson-Lees and Christie 2001). Southbound migration of the species is known along the Mediterranean (Galea and Massa 1985, Iankov et al. 2007, Roth 2008), but subsequent movements are unclear. Some reports suggest a broad-front migration across the Mediterranean (Béltekiné et al. 2010, Birdlife International 2014) and others suggest a funnelled flight through the Levant (Leshem and Yom Tov 1996, Lesham and Yom Tov 1998). However, there is currently no knowledge of the migration behaviour of Red-footed Falcons from central Asia.

We tracked migration of Red-footed Falcons tagged with light-level geolocators on summer breeding grounds in north-central Kazakhstan and we reviewed Russian-language literature on ring recoveries and observations of migration of this species. Our goals were (a) to describe migratory behaviour of Red-footed Falcons in terms of routes, timing and distance, wintering destinations; and (b) to evaluate that behaviour in the context of threats and potential conservation management for the species.

2. Materials and Methods.

We studied Red-footed Falcons on breeding grounds in the Kostanay Oblast of north-central Kazakhstan. Shortly after arrival in Kazakhstan in May, Red-footed falcons lay an average of 3.5 eggs in Corvid nests or nest boxes; on average 2.4 chicks/nest fledge in late July or early August (Bragin 2011). During the breeding season, Kazakhstan’s Red-footed Falcons forage on insects, reptiles and small birds and mammals (Bragin 1989).

We captured falcons with mist nets set near nests or with nooses in the nest. We collected standard morphological measurements, colour ringed, and outfitted the birds with 1.5 – 2g Mk-14 series light-level geolocators with a 2cm stalk (British Antarctic Survey and BioTrack Ltd., UK) by a 2mm-wide Teflon Ribbon harness over the hips (Bally Ribbon Mills, USA).

Falcons were recaptured the following year. Gelocator data were downloaded and post processed using BASTRack Decompressor, TransEdit2, and Locator software. We followed the manufacturer's instructions to handle equinox periods, light thresholds (set at 16) and sun elevation angles (for which final choices were made by comparing accuracy against known summering locations; Beason et al. 2012). We estimated start and end of migration following Jahn et al.'s (2013) protocol and we estimated centroids for winter locations by averaging locations between 15 December and 15 January.

We plotted midnight fixes from the geolocator (Beason et al. 2012) within a GIS for subsequent analysis. We accounted for clock drift (which affects longitudinal accuracy) by measuring the distance between recorded summering grounds after deployment and before recapture and, per manufacturer instructions, correcting for that difference by assuming that drift was constant (linear) over the year the unit was deployed. We accounted for location error by correcting every data point by the difference between the centroid of our calibration period (a 2-4 week period when we knew the birds were breeding) with the known nest location for each bird. We followed the BASTrack instructions for confidence levels but we retained and flagged in our maps apparently reasonable geolocator data from the equinox period (confidence < 9). This approach helps us to identify a most probable general course of migration during this critical but hard to measure period. Finally, we calculated the measurement error from our calibration periods and used that distance to illustrate potential error around geolocator-measured migration routes.

We also report ringing return data from a 30+ year irregular ringing effort conducted at our study site and from an extensive manual survey of records in Russian-language scientific literature.

3. Results

Geolocator tracking: We deployed five geolocators in 2011 (one adult males, four adult females) and 15 geolocators in summer 2012 (four adult males, 11 adult females). We color banded all these birds and an additional 16 adult and 209 nestlings. We recovered 2 geolocators in summer 2013 that had been deployed in 2012 on females. This low geolocator recovery rate (2/20 = 10%) is consistent with or higher than the recovery rates we observed from colour ringing alone (in 2013 we saw only two other colour-ringed falcons, neither with geolocators (4/245 = 1.6%).

Both Red-footed Falcons we tracked engaged in unusual clockwise loop migration that started with a counter clockwise latitudinal movement (Fig 1a, b). Departure from breeding grounds occurred between 5 and 11 September. Southbound routes took the birds north of the Caspian Sea and towards the Middle East. It is not obvious from our data if these birds passed through the Caucasus or west of the Black Sea. Trans-equatorial migration occurred at approximately the same time as the autumn equinox (20 September), when day length is roughly invariant, and so we recorded few useful geolocator data points in this period. Those data that do exist suggest a passage route through the Middle East and northeastern Africa. Total time on migration was approximately 30 days, with arrival in Angola, southern Africa, in the first week of October.

Both birds then took approximately one month to move through Angola into Botswana and Namibia. Winter locations for these birds were centred in east-central Namibia (166033) and west-central Botswana (17372). From February into March, one bird (166033) began drifting north, into Angola, while the other drifted south, into South Africa.

Return migration also occurred close to the equinox and precise departure dates therefore are difficult to estimate. Migration appeared to initiate between the 10th and 30th of March (probably closer to the end of the month in both cases) and birds arrived in northern Kazakhstan on the 5th (17373) and 6th (166033) of May. This northbound trek followed a somewhat coastal route, through Congo, Gabon, Cameroon, Nigeria, Niger and Libya, to a Mediterranean crossing near Italy. Migration continued west and then north of the Black Sea, over the Caspian and then back to Northern Kazakhstan. Both birds stopped over for 1-2 weeks south of the Sahara, a behaviour consistent with refuelling before the subsequent difficult desert and oceanic crossings.

Straight-line distance between northern Kazakhstan breeding grounds and the center of wintering grounds was 9224 (17373) and 9436 km (166033) and estimated minimum over-land distance between these sites was 9518 (17373) and 9666 km (166033). However, the southbound route our birds took was between 9550 km (via the Caucasus) and 11275 km (via Ukraine and Bulgaria). Likewise, the northbound route was approximately 13200 km. Thus, the actual migration route these falcons took was 104 to 143% longer than would be required by a straight-line over-land route between breeding and wintering grounds.

Ring recovery and literature review: Between 1978 and 1987 and 1992 - 1993, E. Bragin deployed 402 bands on red-footed falcons, nearly all nestling birds. Three placed on nestlings were recovered, all during southbound migration. One, deployed on 30 July 1978 was recovered from a bird shot in November 1979 in Lebanon. A second was deployed 14 July 1980 was recovered 11 September 1980 on a bird injured in the south Ural region of Russia. A third, ringed on 25 July 1983, was recovered on 05 November 1984 in the Rostov Region of Russia, northeast of the Azov Sea.

Published Russian-language records of ring recoveries of birds banded in northern Tunesia occurred from Germany and Poland to the north of the Black and Caspian Seas and into the northern Caucasus (Haratchi 1982; Fig 1). This same source suggests that southbound migration is through the Middle East but northbound migration was not well known.

Although our focal population breeds in northern Kazakhstan and neighboring Russia, there are only a few records of this species migrating along a direct overland route, through central Asia. These include an occasional record from east of the Caspian Sea (Isakov 1940, Mitropolskii et al. 1987) and a few records from the north and east of the Aral Sea region (Bostanzhoglo 1911, Zarudnii 1916, Varshavckii 1949, Korelov 1962, Berezovskii, 1983). Farther east, red-foot falcons have been recorded near the Ili River and the Tien Shan Mountain range in extreme southeastern Kazakhstan (Korelov 1962, Kovshar and Berezovikov 1999, Gavrilov et al. 2002), in the Kyzylkum desert (Bogdanov 1882) and near Tashkent (Ivanov 1940). Older records suggest the possibility of a weak spring migration of this species across the Altai and Hindu Kush in Afghanistan (Meinertzhagen, 1938 – cited in Ivanov, 1969).

In contrast, the vast majority of observations of migration of red-foot falcons are from north of the Caspian and Black Seas. In particular, thousands of birds have been observed in the mid-level reaches of the Ural River (Bostanzhoglo 1911). Similar numbers of birds have been observed in the North Caucasus region of Russia (Dagastan and Stavropol; Malovichko et al. 2003). From there, the most likely route for the majority of falcons is north of the Black Sea, where thousands of birds have been observed over the lower reaches of the Dnieper River near the towns of Cherson and Ochakov (Petrovitch and Redinov 2008). In contrast, few birds are observed near the Caspian Sea (Komarov 1985; Polivanov et al. 1985; Mikheev 1985) and only a few hundred are seen crossing the Caucasus (Abuladze et al. 2003).

4. Discussion

Our data and literature review describe, for the first time, the remarkable loop migration of central Asian red-footed falcons and the dramatically longer route these birds travel to avoid desert and mountain crossings near their breeding grounds. They also demonstrate the geographic breadth of raptor breeding locations of populations vulnerable to shooting at Mediterranean stopover sites.

It is well documented in literature that red footed falcons migrate in large numbers through the Middle East in autumn, that they winter in southern Africa, and that they pass in large numbers through the Mediterranean during spring migration. It is now clear, however, that for birds from Russia, Ukraine and Central Asia, there are at least two autumn migration tracks. One of these passes through the Caucasus into Turkey and the Middle East. The other, probably the more important one, passes north of both the Black and Caspian Seas, south along the Bosporus, through Turkey and into the Middle East. From there, the birds appear to migrate more or less directly southwest, to their well-known migration grounds. We saw no evidence for a southbound marine crossing (this contrasts with the tracked Hungarian birds that do make such a crossing). Their return flight is more directly north, taking them through Tunisia and Libya, across the Mediterranean and northward. Birds then travel north of the Black Sea and turn west, towards central Asian breeding grounds.

Birds of northern Kazakhstan that winter in southern Africa must overcome many challenges to survive migration. Heading directly south would force the birds to endure the harsh climate of multiple central Asian and Middle Eastern deserts before reaching the Sahara. In contrast, by migrating westward, through Russia, the birds to remain in habitats similar to those in which they breed. Presumably these habitats also provide more easily accessible forage and the opportunity to make desert crossings in better condition. However, the cost to this behavior is the addition of 40% more travel distance and time than would be incurred by a direct, overland flight. Thus although traveling west before south dramatically increases total flight distance, such a route allows maintenance of migratory reserves that may be essential to crossing the unavoidable Sahara.

The remarkable loop migration of these falcons also demonstrates the breadth of the extent to which shooting of raptors may impact populations. Kostanay Oblast is approximately 2200 km from Malta, yet birds that breed in this part of central Asia are exposed to shooting risk in the central Mediterranean. Thus shooting on this small island has the potential to impact birds that breed continents away and conservation of central Asian migrants involves addressing threats they face on their long distance migration, not just on steppe breeding grounds or Afro-tropical wintering grounds.

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ҚЫРҒИДЫҢ ОРТАЛЫҚ АЗИЯДАН АЛЫС ТРАНС-ЭКВАТОРЛЫҚ МИГРАНТЫНЫҢ ТІЗБЕКТІ МИГРАЦИЯСЫ – ҚАШЫҚТЫҚ ПЕН ТӘУЕКЕЛДІЛІКТІҢ АРТУЫ

Геолокаторлардың деректеріне, құстарды сақиналау және әдебиеттерді талдау нәтижесіне сәйкес қырғидың Солтүстік Қазақстаннан басталатын тізбекті миграциясы Шығыс Еуропаның ірі ішкі теңіздерінің айналып, батысқа қарай ұшуымен, Африканың оңтүстік бөлігіне дейін созылады. Қайту миграциясы негізгі екі миграциялық барьер арқылы: Сахара және Жерорта теңізінен батысқа қарай кесіп өтіледі.

Сипатталған тізбекті миграция ендік бөліктеріне ұзындық бойы созылады, шөлдерді, тауларды, теңіз акваториялары мен Жерорта теңізінің «бөтелке мойын» тәрізді аймақтарды кесіп өтумен сипатталады, онда әдетте жыртқыш құстарға спорттық аңшылық жүргізіледі.

Мақаланың мәнін ашатын сөздер: *қырғи, геолокатор, Қазақстан, тізбекті миграция.*

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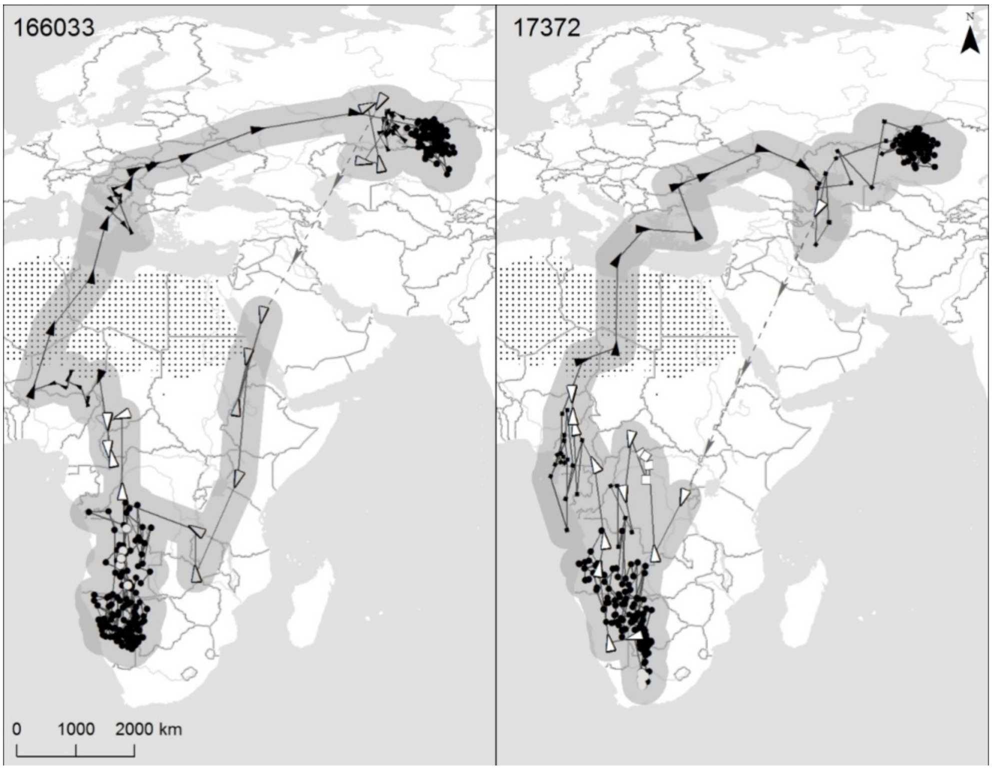
ПЕТЛЕВАЯ МИГРАЦИЯ ТРАНС-ЭКВАТОРИАЛЬНОГО ДАЛЬНЕГО МИГРАНТА КОБЧИКА ИЗ ЦЕНТРАЛЬНОЙ АЗИИ - УВЕЛИЧЕНИЕ ДИСТАНЦИИ И РИСКОВ

Согласно данным геолокаторов, кольцевания и анализа литературы, кобчики из северного Казахстана имеют петлевидную миграцию, которая начинается с длительного перелета на запад вокруг больших внутренних морей Восточной Европы, а затем продолжается до южной части Африки. Обратная миграция проходит западнее и пересекает два основных миграционных барьера: Сахару и Средиземное море.

Описанная петлевая миграция характеризуется протяженным широтным участком, пересечением пустыни, гор, морских акваторий и Средиземноморских «бутылочных горлышек», где обычна спортивная охота на хищных птиц.

Ключевые слова: *кобчик, геолокатор, Казахстан, петлевая миграция.*



Picture 1. Migration routes show geolocator data from two female red-footed falcons tagged in north-central Kazakhstan. Filled circles are summer and winter locations, triangles show directionality of migration travel; unfilled triangles representing data with l s confidence (those recorded during es the equinox); squares are stopovers; dotted lines are periods with no data. The buffer around the lines is the average error from known locations estimated during the breeding period. The Sahara desert, a dangerous crossing, is dotted.

УДК: 330

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HUMAN CAPITAL AND VERTICAL SKILL MISMATCH: THE CASE OF THE NEW EU MEMBER STATES FROM EASTERN EUROPE

Abstract

The purpose of this study is to shed light on the link between human capital and vertical mismatch in the 11 new EU member states from Eastern Europe. Human capital is measured by the percentage of the active population having completed higher education. In the economies under consideration both the number of tertiary education graduates and the degree of the skill mismatch have been sharply increasing since the year 2000. The rate of the job mismatch appears to be positively influenced by the share of female graduates. On the other hand, it is negatively linked to the gross value added of the trade-related services.

Keywords*: human capital, higher education, skill mismatch, labor market, new EU member states.*

1. Introduction.

According to the theoretical studies, the quantity of human capital measured by the educational attainment of the population is one of the major factors which fuel growth in the con-