Міграції	Беркут	14	Вип. 1	2005	124 - 129

PECULIARITIES OF VISIBLE SEASONAL MIGRATIONS OF BIRDS IN TISZA BASIN HEADWATERS (EAST CARPATHIANS, UKRAINE)

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Abstract. Spring and autumn migration of the birds is described according to day-time observations. Birds cross the Eastern Carpathians using river valleys. In autumn about 1.5 million of Rooks pass over the Eastern Carpathians within Ukraine. Many birds have stopovers in Transcarpathian region. Some aspects of the study of bird migrations in mountains are discussed.

Key words: the Carpathians, migration, number, stopover, study.

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Особенности видимых сезонных миграций птиц в верховьях бассейна Тисы (Восточные Карпаты, Украина). - А. Луговой. - Беркут. 14 (1). 2005. - По результатам многолетних дневных наблюдений описаны весенняя и осенняя миграции. Птицы пересекают Восточные Карпаты, используя долины рек и перевалы, а также вырубки. По общей оценке осенью Украинские Карпаты пересекает около 1,5 миллионов грачей. Многие птицы останавливаются на отдых и кормежку на Закарпатье. Обсуждаются некоторые вопросы изучения миграций птиц в горах.

In the reports containing descriptions of passage ways in the Palaearctic region some peculiarities of migration in the mountain areas, particularly in the Carpathians, are often left out of account. Meanwhile, the Transcarpathian seasonal migrations are of rather great scale and are of both theoretical and practical (hunting, aviation ornithology, epizootiology) interest.

The Carpathian mountain arc is known to consist of the following geographical formations: the Western, Eastern and Southern (Transylvanian) Carpathians. It was F. Strautman (1957) who first noted that of these three the most favourable for passages of birds are the Eastern Carpathians situated mostly in Ukraine being the lowest (the upper limit is 2061 m, the height of mountain passes is 830–950 m above sea level). In our turn, we can add that the Eastern Carpathians are not only the lowest, but the narrowest sector of the Carpathian mountains that can be overcome by the birds which are not ecologically used to the forest mountain areas, in shorter time than the other sectors. Very essential is the fact that the Tisza river, as well as its tributaries, rise from the southern megadeclivities of the Eastern Carpathians within the Transcarpathian region of Ukraine*, and carry their waters in the south-west direction. Thus, the channels and valleys of the rivers are oriented in such a way that their directions coincide with that of the birds passage (downstream in autumn, upstream in spring).

In spring the birds passing the Pannonnian (Central Danubean) Plain north-eastward find themselves in a wide gate (about 250 km) formed by the spurs of the Carpathian arc. The mountains gradually make the plain narrower, and the flocks of birds flying on through this natural corridor finally encounter to the piedmonts of the East Carpathians in the area of the Transcarpathian Lowland in Ukraine (the valleys of the rivers Uzh, Latoritsa, Tisza, etc.) and in Eastern Slovakia (the Ondava river) (see Fig. 1). Then they fly over the mountains.

* Transcarpathia (Transcarpathian region of Ukraine) is an official name of the territory which from the point of view of those living in Central Ukraine is actually situated on the other side of the Carpathians. But from the point of view of West Europeans this area is situated before the Carpathians, in the north-east corner of the Pannonian Lowland and on the southern slopes of the Eastern Carpathians.

These peculiarities of birds migration in the Carpathians attracted our attention long ago, and as early as in the 1970s we put forward a proposal on the advisability of establishing a Centre for birds ringing and passage studies (Vainagy, Lugovoy, 1978). The proposal – alas – has not been practically realised in the full volume.

Nevertheless, while working at the CarpathianNature Reserve in the late 1980s and then at Uzhgorod National University, alongside with other problems we were engaged in the problems of birds migration in the Carpathians. The results of these studies were reported (Lugovoy, 1992, 1999a, 1999b; Lugovoy, Potish, 1996a, 1996b, 1996c). As we did not have any special equipment, we only studied the day-time, visible passages of birds over the Carpathians, though we know that the scale of night migrations is pronounced here.

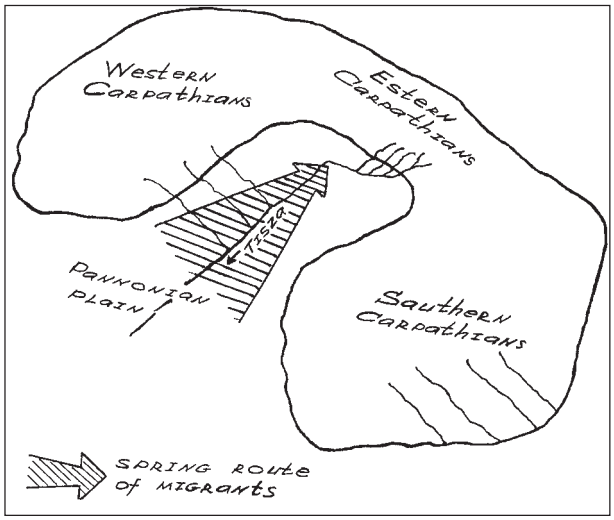

Fig. 1. Carpathian "gates" for spring migrants.
Рис. 1. Карпатские "ворота" весенней миграции.

As a result, by now we have more or less clear picture of the Transcarpathian passages of many common birds (genera *Anser, Larus, Corvus, Vanellus, Fringilla,* etc.).

Natural remnants of once vast wetlands of the Transcarpathian Lowland and the adjacent territories are flooded in the period of spring floods, forming noticeable areas of water surface – partly in the plain forests, partly in the open landscapes. These water areas become an arena of concentration of hydrophilous birds which are going to start out to the north. Our limited facilities (for the full examinaton we need aerial survey) only allowed perhaps to study more or less in detail overflows of the Latoritsa river near Chop (the Peresh Forest, adjacent open areas near the villages of Mali Heyevtsi, Tysyanka). In late February and up to the middle of April many thousands of hydrophilous birds are concentrated there whose numbers and species composition constantly change. Since the observations of there concentrations were carried on from the dykes that had not been submerged with the help of a simple 12^x field binocular (we do not possess tripod optics with more powerful magnification) the species composition has not been studied completely enough.

Nevertheless, it has been stated that in spring the following birds have their stopovers: Mute Swans (*Cygnus olor*), three species of geese (*Anser fabalis, A. albifrous, A. anser*) many species of ducks, including such rare for the region as the Goldeneye (*Bucefala clangula*), Ferruginous Duck (*Aythya nyroca*), Wigeon (*Anas penelope*), Pintail (*A. acuta*), Shoveller (*A. clypeata*), etc. Sometimes there are thousands (up to 5,000) of Lapwigs (*Vanellus vanellus*), Black-headed (*Larus ridibundus*) and Common (*L. canus*) Gulls, gatherings of Ruffs (*Philomachus pugnax*) and Coots (*Fulica atra*). On the shallow puddles away from the main waters, Black-tailed Godwits (*Limosa limosa*) occur, and sometimes Curlews (*Numenius arquata*), Dunlins (*Calidris alpina*) and even Red-necked Phalaropes (*Phalaropus lobatus*). In the air Snipes (*Gallinago gallinago*) are uttering their mating calls, but few of them stay here for the breeding period. In spring Jack Snipes (*Lymnocryp-*

tes minima) are also observed. As we noted earlier (Lugovoy, Potish, 1996c) the flooded area in this place is about 10,000 hectares and up to 15 thousand birds can be seen there simultaneously. But this figure constantly changes depending on the successfulness of birds' passing to the north across the Carpathians and as a result of arrival of new migrants from the south of the Pannonian Plain. When the durable periods of bad weather in the mountains prevent the passage, the concentrations of birds in the observed water areas rise drastically.

Similar pictures can be evidently observed in other places of the Transcarpathian Lowland as well, but we could not visit these in the period of spring floods.

During the period of autumn passages there are usually no floods of rivers in the Transcarpathia. Therefore, there are no gatherings of hydrophilous birds like those described above. However, in the rainy year of 1998 some areas near the villages of Heyevtsi and Tysyanka were flooded or swamped in June – September, and this changed the situation of the passing birds which to some extent began to remind the early spring picture. At least, this concerned the fauna of passing waders (Lugovoy, Potish, 1999).

From this fact it is easy to conclude that in the past, before the draining amelioration of major areas of wetland in the Transcarpathian Lowland – those of Chorny (Szerne) Mochar (13,000 ha.) and Bagony (about 7,000 ha.) the numbers of passing hydrophilous birds in the region were by far more considerable. The same wetlands played also the most important role in conservation of the fauna of nesting hydrophilous birds. The works of A. Hrabar (1931, 1932) can witness this.

According to the estimation of E. Odum (cited from: Aubrecht, 1987) flooded territories in the USA cost from 50 to 125 thousand of US dollars per hectare, which 5–10 times as high as the purchase price of arable farmlands. The same situation may be expected in Europe. That is why we cannot help but agree with the proposal put forward by expert hydrologist V.S. Kravchuk (1992) who rises the question rehabilitation of the ameliorative system in Chorny Mochar. He considers the question from the standpoint of conservation of the water balance in the region. But the vegetation and wildlife of Transcarpathia would undoubtedly profit by it.

The beginning of **spring migration** (late February – March) is the time when on both sides of the mountains, in particular in the southern aspect on the adjacent plains there are already conditions favourable for most of the birds (there is no snow in the fields, the river plains are flooded), while in the mountain forests and subalpine meadows the winter climatic picture is still observed. All this makes the birds behave as follows:

a) First cross the Eastern Carpathians in their western part (the Beskides) along the valley of the Uzh and those of the neighbouring rivers, where the mountains are lower and their forest belt is not so wide as in the east of Transcarpathia. First of all it concerns such "field" birds as the Rook (*Corvus frugilegus*), that in this season of the year shows a pronounced passage in the west of the Transcarpathian region, while in the east it is expressed not so well.

b) Since this area of the Eastern Carpathians is the most suitable for passages, crowding of wetland birds (geese, gulls, ducks, waders) before their "spurt over the mountains" can be seen best in the flooded plain of the Latoritsa river near the town of Chop.

c) Along with the mountain stream channels which are important as the leading arteries for the waterfowl passage, an essential role is played by the situated parallel to the rivers roads with asphalt topping, on which the snow melts rapidly. Along these roads small passerines (*Fringilla coelebs,* etc.) move in masses. The role of these anthropogenic paths is important both in the west and in the east of the Transcarpathian Region.

In **autumn** the situation is quite different. By the period of the main passage (October) there is usually no or almost no snow in the mountains, but at the same time there are no

flooded plains that are very important as the stopover sites for the waterfowl. In such conditions:

a) The migrations of field birds occur very actively both in the west and in the east, even more active in the east (more abundant along the Tisza river than along the Uzh).

b) The passage of waterfowls is not so noticeable, it occurs without long stopovers and crowding of birds. Suffice it to say that out of 290 geese flocks observed by us only 16 per cent were recorded in autumn, the great majority of occurrence (84 %) was registered in spring.

c) In autumn the automobile roads are not so important for migrations of birds to their wintering grounds.

We have estimated the volumes of visible passages. Summing up the stationary accounts in different points of Transcarpathia we can assume that in autumn about 1.5 million of Rooks pass over the Eastern Carpathians within Ukraine. Sometimes 30 to 35 thousand of the birds per day were noted flying over the area of the Tisza river headwaters near Rakhov. As to the wild geese, we find it difficult to give the quantitative estimation, since we possess only the data of day-time observations, while geese can fly at night as well. However, to characterize their passage volume we can give the following information: in spring via a single point near Uzhgorod (the Uzh river valley) during 2-hour daily observations from 19.02 till 1.04.1995, total number of 2030 geese were registered in flocks of 5 to 200 individuals (the mode is flocks of 50 to100 birds). In the old years the White-fronted Goose (*Anser albifrons*) used to be the "leader" of all the *Anser* species migrating the Carpathians. According to L.V. Szabo's data (1979), about 40 thousand of these birds having wintered in Pannonia flew then northward via the Carpathians. However, as G. Dick (1987) states, the situation for the Danube has drastically changed. At present the White-fronted Geese rarely winter there (at the same time in the Netherlands their number has increased). The first place is kept by the Bean Goose (*A. fabalis*) being now in the lead during the spring passages over the Carpathians. The bean goose is in the second place, and only behind these two there is the Gray-lag Goose (*A. anser)*. The same pattern is confirmed both by observations in Sumy region in northeastern Ukraine (Knysh, Arkhipenko, 1978), and by those from the wintering sites on the Danube, where in 1973 the Bean Goose was noted mainly (up to 95 %) and no Gray-lag Geese were observed at all.

Rivers, their channels and valleys play an important part in "guiding" birds in the mountains. It can be well seen in foggy mornings and on dull cloudy days. Then rooks and gulls fly very low, closely to the surface of the river, following all its windings without deflections (there are wooded steep slopes to the right and to the left). However, when the weather is sunny and cloudless the birds gain the height and flying over the mountain peaks cut their way to the stopover and feeding sites. Thus, in autumn, when the weather is sunny, near the town of Rakhov the rooks fly straight to the Solotvino depression instead of flying along the Tisza meander, making their way much shorter to save their energy (see Fig. 2).

An important role in guiding the bird migration streams is played also by the mountain passes of anthropogenic origin, which cover considerable areas of clearings and have the appearance of wooded fields. It can be particularly clearly seen in the behaviour of the birds of forest-steppe mode of life, e. g. Rooks. We registered the birds at the place where the Chorna Tisza (flowing from the Yablonevets pass) and the Bila Tisza (there is not any pass in its headwater) flow together to form the Tisza River proper. On 19 and 20.10.1983, during 1 hour on each day the following observations were registered:

– from the side of the Chorna Tisza – 6 and 8 flocks of 2000 and 2600 Rooks;

– from the side of the Bila Tisza – 2 flocks on both days, their total number was 700 Rooks.

Many instructions on passage birds registration methods recommend to conduct obser-

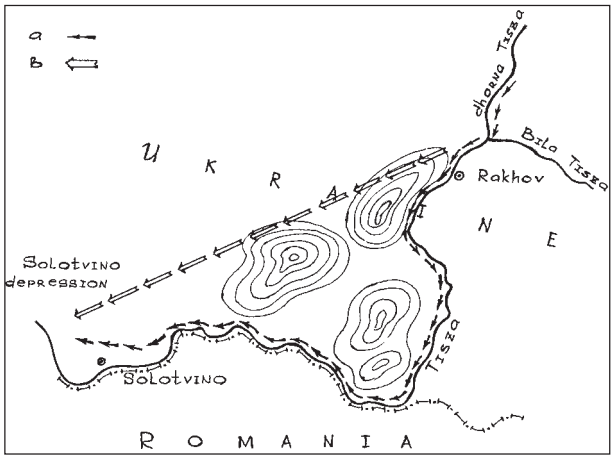

Fig. 2. Scheme of the autumn passage of rooks in the headwaters of the Tisza river:
a) in the foggy and dull weather;
b) in the fair sunny weather.
Рис. 2. Схема осеннего пролета грача в верховьях Тисы.

vations at the morning hours just after the sunrise. At this time of the day, they say, "the main bulk of day-time migrants passes". This statement does not work for the mountain lands. Thus, in autumn on the southern, "Transcarpathian" side the passage has the following pattern: during the first hour, just before the sunrise, about 5 % of the daily norm of migrants pass. These are the birds that have passed the mountain range overnight and had an overstop near the registration centre. Then there is a pause, 2 to 3 hours long, when over the registration centre 0.4 to 2 per cent of the daily norm of birds fly. And only then the active passage (from 10 to 18 % of the daily "norm") takes place. By 15^{00} – 16^{00} the passage gradually comes to an end. At the day-time height of passage we deal with the birds having started from the area to the north of the Carpathians, while the pause lasts until the birds overcome the mountain barrier. Of course, the nearer the observation point to the barrier, the shorter the pause. Thus, in Rakhov (40 km from the watershed) the pause lasts 2 hours, while in Uzhgorod (100 km from the watershed) it lasts 3 hours.

It should be pointed out that some aspects of migrations are difficult to track basing on the materials gathered only from one side of the mountains, in our case, from their southwest megadeclivities. Such a "unilateral" variant of studies is particularly inconvenient in the period of spring passage. Due to the abundant snow in the mountains, frequent bad weather conditions many birds having started in the Transcarpathian Plain have to come back without overcoming the mountain range. That is why it is often hard to estimate how many flocks and what number of birds have actually passed northward. In autumn there is another situation: all the birds that are flying within the basin of the Tisza river towards the Pannonian Lowland have already overcome the mountain barrier, and the volume of passage can be exactly estimated on any day of the observation.

The best way to study migrations of birds in the Eastern Carpathians is to do it synchronically, having points for observations both on the northern and on the southern slopes of this mountain land. Such studies could be conducted if a permanent ornithological station were organized in the region, whose researchers could expand the fields of studies, develop ringing of passing birds, etc. Up to now all the institutions of this kind not only in Ukraine, but also in the neighbouring countries (Russia, Poland), are situated either along the sea coast, or on the lowland rivers. There are no mountain ornithological stations in East Europe. Studies of the migration process under different conditions which mountains suggest, can essentially enrich our knowledge in this field of ornithology.

This paper has been prepared for publishing within the framework of carrying on the theme "Biodiversity, Conservation and Sustainable Use of the Transcarpathian Riverine Forests" (WWF) UK 006702 P.

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Génsbøl B., Thiede W. Greifvögel. München: BLV, 2005. 415 S.

Вышло из печати четвертое издание одного из лучших определителей хищных птиц Западной Палеарктики. Книга переработана, дополнена новой информацией и иллюстрациями.

Структура определителя осталась прежней. Вступительная глава посвящена описанию биологии и проблем охраны хищных птиц. Далее идут повидовые очерки, в которых приводятся краткие сведения по распространению, численности и ее изменениям, миграциям, местообитаниям, голосам, гнездовой биологии, питанию, технике охоты. Распространение каждого вида проиллюстрировано картосхемой, есть таблицы с указанием численности и популяционных трендов для всех стран Европы.

Для полевых орнитологов наиболее интересна следующая часть книги, посвященная определению хищных птиц в природе. В ней детально описаны основные определительные признаки, половые и возрастные отличия, основные цветовые морфы. Причем внимание обращается не только на морфологию и окраску, но и на особенности полета и поведения птиц, что значительно облегчает работу в поле. Все это проиллюстрировано высококачественными цветными рисунками. Особое внимание уделяется сравнительному описанию близких видов, с которыми можно спутать данную птицу.

В.Н. Грищенко