Egretta 45: 104-114 (2002)

The occurrence of Long-legged Buzzard (*Buteo rufinus*) in parts of Central Europe during 1980-1998 and possible factors for its recent expansion

Vojtěch Mrlík und Bedřich Landsfeld

Mrlík, V. & B. Landsfeld (2002): Das Vorkommen des Adlerbussards (*Buteo rufinus*) in Teilen Mitteleuropas zwischen 1980 und 1998 und mögliche Gründe für seine Ausbreitung. Egretta 45: 104-114.

Die Balkanhalbinsel beherbergt eine starke Brutpopulation des Adlerbussards. Dieses früher unterschätzte Vorkommen war offensichtlich auch die Quelle für die in zunehmender Zahl in Mitteleuropa zu beobachtenden Vögel. Bereits Glutz von Blotzheim et al. (1971) erwähnen eine Arealerweiterung nach Nordwesten und dokumentieren 178 Nachweise aus Mitteleuropa. Bis in jüngere Zeit hinein gelangen die meisten dieser Beobachtungen allerdings außerhalb der Brutzeit. In der zweiten Hälfte des 20. Jahrhunderts und besonders in den letzten beiden Jahrzehnten kam es dann zu einer Zunahme der Nachweise während der Brutzeit, ein erster Brutnachweise für Mitteleuropa gelang 1992 in Ungarn (Dudás & Sándor 1993, Dudás et al.1993). In der vorliegenden Arbeit werden 16 Beobachtungen aus Tschechien und der Slowakei dokumentiert. Diese rezenten Daten werden mit früher veröffentlichten Angaben verglichen. Auch in diesem Raum kam es zu einer Zunahme der Brutzeitbeobachtungen. Mögliche Gründe dafür sehen wir in einem von der Balkanhalbinsel ausgehenden Populationsdruck, in durch globale Erwärmung verursachten klimatischen Veränderungen sowie in der Ausbreitung von offenen Ackerbaugebieten (Kultursteppen). Das Nahrungsangebot scheint die Ausbreitung in geringerem Ausmaß zu beeinflussen.

Keywords: *Buteo rufinus*, Long-legged Buzzard, expansion, central Europe.

1. Introduction

The centre of occurrence and principal nesting area of the Long-legged Buzzard (*Buteo rufinus*) is situated in Asia from the foothills of the Altay in the east across the Himalayas towards Anatolia in Turkey in the west, from the Kirghiz steppe and foothills of the Urals in the north to the Persian Gulf, Iraq, Syria and Lebanon in the south (Glutz von Blotzheim et al. 1971). What is probably the most healthy European population inhabits the Balkan Peninsula where about 500 nesting pairs are estimated (Mebs 1994). Evident penetration of this raptor to Central Europe has been recorded since the middle of the 20th century (e.g. Sterbetz 1960, Glutz

von Blotzheim et al.1971, Kovács 1992). Glutz von Blotzheim et al. (1971) noted indications of a general expansion of the species northwards. Possible causes of this phenomenon have not yet been discussed in detail. Certain factors considered by Sládek (1959) as important for the expansion of the breeding range of the Eastern Imperial Eagle (*Aquila heliaca*) may also play a part.

2. Material and methods

An even more marked expansion northwards of the range of Long-legged Buzzard may be expected. We therefore analysed the occurrence of this species in Central Europe, especially in Austria, the Czech Republic and Slovakia, and compared recent data with those published in the past. The majority of recently published data are summarised. In our analysis of the data we attempted to study possible causes of the recent expansion of the Long-legged Buzzard into Central Europe.

We would like to thank P. Žák for field assistance and the members of the Rarities Committees in the Czech and Slovak Republics, J. Chytil, D. Karaska and J. Chavko for their help in data collection.

3. Results and discussion

3.1 Occurrence in Central Europe

Records of Long-legged Buzzards in Central Europe during the non-breeding period are not uncommon. For instance, individual sightings are documented for Poland, Hungary, Austria, the Czech Republic, Slovakia, Switzerland, Germany, France, Spain (Canary Islands, first record in April 1995, Anon 1996a), Denmark and the Netherlands (e.g. Anon 1994, Anon 1996a,b). Glutz von Blotzheim et al. (1971) and Cramp & Simmons (1980) summarise 178 records during the past years. 120 of these are from August-October, 17 from November-January, 21 from February-April and 20 from May-July.

The observations in some European countries during the last 19 years (from 1980-1998) are in so far interesting as during these years the frequency of records increased particularly in the breeding period (Fig.1).

In Austria, Long-legged Buzzards were observed in these 19 years seven times between August and October, four times between November and January, two times between February and April and 11 times between May and July. Several individuals stayed for a longer time in the same location e.g. 18.6.-14.8.1982 (1-2 ind.), 27.4.-3.6.1991 (1 ind.), 10.9.1991-1.2.1992 (1 ind.). Thus at least 24 Long-legged Buzzards were observed in Austria between 1980 and 1995 (Ranner et al. 1995, Laber & Ranner 1997). Since 1996 further birds were recorded in the country (e.g. 1 ind. in September 1999, M. Rössler in Zuna-Kratky et al. 2000).

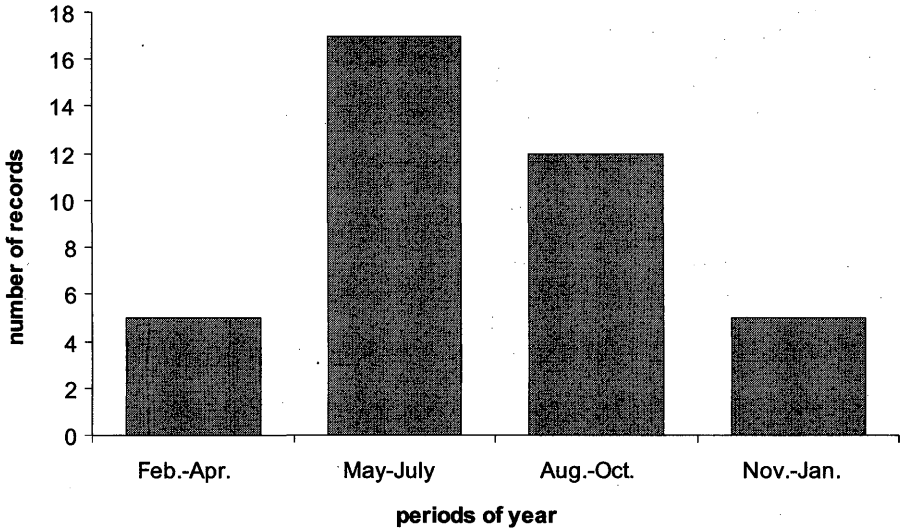

Fig. 1. Seasonal occurrence of Long-legged Buzzard (*Buteo rufinus*) in Austria, Slovakia and the Czech Republic 1980-1998 (Ranner et al. 1995, Laber & Ranner 1997, Slovak and Czech Rarities Committees).

*Abb. 1: Beobachtungen des Adlerbussards (*Buteo rufinus*) in Österreich, der Slowakei und Tschechien in Jahresablauf 1980-1998. (nach Daten in Ranner et al. 1995, Laber & Ranner 1997, Slovak. & Tschech. Seltenheitenkommissionen).*

Data from the Czech and Slovak Republic have been summarised by Jirsík (1941), Ferianc (1964), Štollmann (1967), Hudec & Černý (1977), Hudec et al. (1995) as well as Trnka (1997). Hudec & Černý (1977) noted that the species occurs more frequently in Slovakia (15 times) than in Bohemia (8 times) and Moravia (4 times). According to these authors Long-legged Buzzards were recorded 12 times between August and October, five times between November - January, three times between February and April and once from May to July.

For the last 19 years (1980-1998) we are aware of the following 16 records. These are listed in Tab. 1 and their geographical locations shown in Fig. 2. The data certainly represent the majority of sightings of Long-legged Buzzards on the territory of the Czech and Slovak Republics during the period 1980-1998. Records from spring and the summer months from March to the end of August predominate in the data (70.6 %, n = 17; 6 ind. in CZ and 6 ind. in SK, respectively). A precise breakdown is: October (2 birds in CZ and 1 bird in SK), December (1 in CZ), January (1 in CZ), February (1 in CZ), March (2 in CZ), April (2 in CZ, 4 in SK), May (6 in SK), June (4 in SK), July (1 in CZ, 4 in SK), August (2 in CZ, 4 in SK), September (1 in CZ), date not given (1 bird in SK).

Tab. 1: Records of Long-legged Buzzard (*Buteo rufinus*) in the Czech and Slovak Republics 1980-1998. Numbers correspond to Fig. 2.

Tab. 1: *Nachweise des Adlerbussards (*Buteo rufinus*) in Tschechien und der Slowakei in den Jahren 1980-1998. Nummern entsprechen Abb.1.*

Nr.	date	location	observation	source
1	10.7.1982	near the villages of Tovačov and Troubky (Přerov, CZ)	1 ind.	Šírek & Hudeček (1991), Chytil 1992, Musil (1992)
2	24.12.1984-27.3.1985	between the villages Rohovládova Bělá and Bukovka (Pardubice, CZ)	1 ind.	Štancl & Štanclová 1996, Bejček et al. (1995)
3	12.4.1989	near Hustopeče nad Bečvou (Přerov, CZ),	1 ind.	J. Polčák in Chytil (1992), J. Polčák in Musil (1992)
4	27.10.1989	Lednice (Břeclav, CZ)	1 ind.	D. Horal in Chytil (1995)
5	4.4.1990	Petrov (Hodonín, CZ),	1 ind.	D. Horal in Chytil (1995)
6	3.10.1992	Dunajovické kopce hills near the village Březí (Břeclav, CZ)	1 ind.	J. Chytil in Danko (1994)
7	18.3.1995	Čechy (Přerov, CZ)	1 ind.	D. Lucan in Chytil (1997)
8	3. & 9.8. 1998	Paseka (Olomouc, CZ)	1 ind., 3rd calendar year, (det. V.Mrlik from photo)	O. Suchý in (Chytil & Vavřík (1999)
9	21.8.1998	Dlouhá Loučka (Olomouc, CZ)	1 ind., 2nd calendar year (det. V.Mrlik from photo)	O. Suchý in (Chytil & Vavřík (1999)
10	17.9.1998	Mastník (Třebíč, CZ)	1 ind. brought to the Station for Fauna Protection in Pavlov, 2nd calendar year (see Fig. 3)	A. Toman in (Chytil & Vavřík (1999), A. Toman in Šimek & Brandl (1999)
11	6.5.1984	near the village Bojná (Topoľčany, SK)	2 ind. (pair)	Ferianc & Feriancová-Masárová (1984)
12	ca. 1994	districts Humenné-west and Svidník-east (SK)	probably 1 ind.	Maderič et al. (1995)
13	ca. 1995	Bratislava airport (SK)	2 ind. during breeding period	J. Chavko (pers. com.)
14	ca. 1996	Bratislava airport (SK)	1 ind. during breeding period	J. Chavko (pers. com.)
15	11.10.1996	Folkušová (Martin, SK)	1 ind. in full adult plumage (det. V.Mrlik from photo)	V. Mrlík, B. Landsfeld and P. Žák
16	ca. 1997	Bratislava airport (SK)	1 ind. during breeding period	J. Chavko (pers. com.)

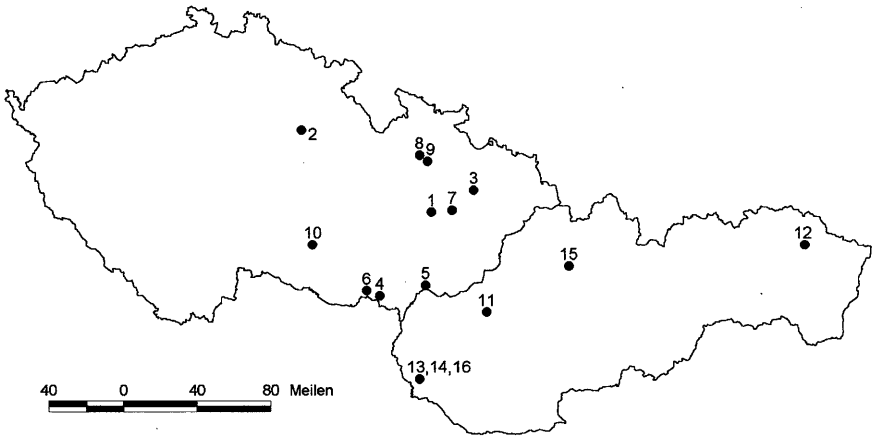

Fig. 2. Records of Long-legged Buzzard (*Buteo rufinus*) in the Czech and Slovak Republics for the years 1980-1998.

*Abb. 2: Nachweise des Adlerbussards (*Buteo rufinus*) in Tschechien und der Slowakei in den Jahren 1980-1998.*

Less than half of the records (6 birds, 35.3 %) from the territory of the Czech Republic and Slovakia are from the migration period. The departure from breeding sites takes place between late August and mid-October. Spring migration is not clearly limited as Long-legged Buzzards e.g. arrive in Israel between February and April, in Turkey in mid-March, in Bulgaria at the end of March and in the southern parts of the former USSR in mid-April (Glutz von Blotzheim et al. 1971, Cramp & Simmons 1980). Data from the Czech and especially Slovak Republics are nevertheless remarkable as they are mainly concentrated in the nesting period between April and August (11 birds, 64.7 %).

It is evident that the recent occurrence of the species in Austria and the Czech and Slovak Republics is mainly influenced by its more frequent occurrence and scarce nesting in Hungary (Kovács 1992, Dudás, Kovács & Sándor 1993, Dudás & Sándor 1993, Anon 1996a, Urbán et al. 1998).

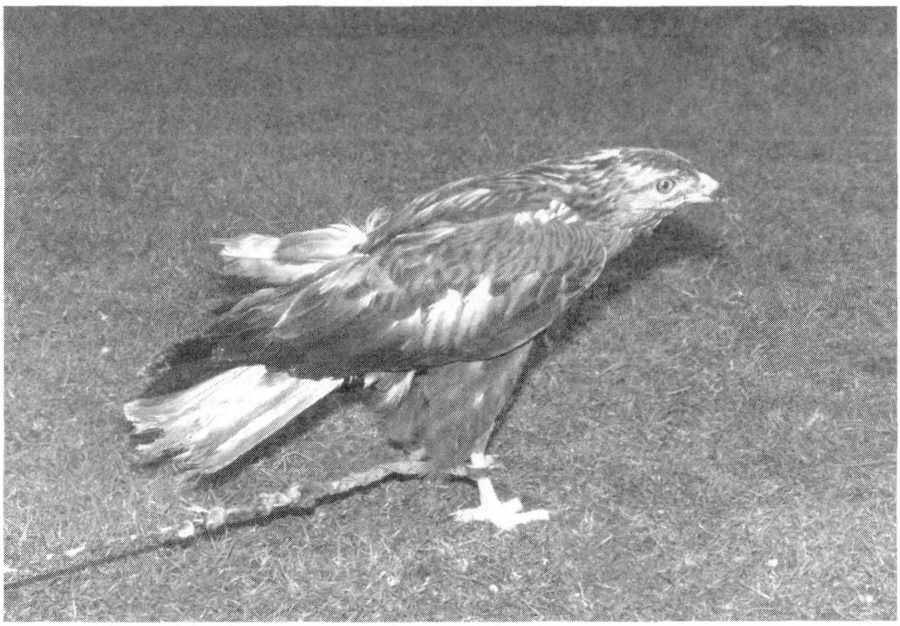

Fig. 3: Third-year Long-legged Buzzard (*Buteo rufinus*) found in Mastník (district of Třebíč, CZ), Station for Fauna Protection Pavlov, 16.3.1999, (Photo V. M r l í k).

*Abb. 3: Dreijähriger Adlerbussard (*Buteo rufinus*), in der Pflegestation Pavlov, 16.3.1999. Aufgefunden in Mastnik im Bezirk Třebíč, Tschechien* (Foto V. M r l í k).

3.2 Indications for range expansion

Until recently, nesting of Long-legged Buzzard was unknown in Central Europe. The nearest known breeding sites were in the Balkan Peninsula (Greece, Turkey, Bulgaria, former Yugoslavia). Although this population was not large (less than 100 pairs according to Hudson 1975 cited in Cramp & Simmons 1980) a general expansion of the species northwards was suggested by Glutz von Blotzheim et al. (1971). This was based on the situation in Bulgaria and perhaps also in Turkey and Tunisia (Glutz von Blotzheim et al. 1971, Bijleveld 1974, del Hoyo et al. 1994). In contrast, the numbers of breeding pairs decreased or remained unchanged in other nesting areas in the Mediterranean and around the Black Sea (e.g. Israel, Egypt, Ukraine, European part of Russia). The preconditions for an expansion in these areas were thus not fulfilled (former Yugoslavia, Greece, Albania, European part of Russia, Turkey, Lebanon, Libya, Egypt, Morocco) (Cramp & Simmons 1980). For a relatively long time a certain degree of expansion was evidenced by the arrival of Long-legged Buzzards to Central Europe, i.e. to areas far from their nesting and wintering sites, mainly outside the breeding period. Most records during this

time were reported from the lowlands between the Carpathian Mountains (Carpathian Basin) and in Hungary (Great Hungarian Plain) (Cramp & Simmons 1980).

However our knowledge of the development of the breeding populations in the Balkans is relatively poor. Mebs (1989) gave 150-200 pairs for Yugoslavia, Bulgaria and Greece in 1989 but only five years later he reported about 500 breeding pairs for the whole Balkan Peninsula (Mebs 1994). According to Cramp & Simmons (1980) occasional nesting in former Yugoslavia was confined to Hercegovina, but other authors reported nesting also in Yugoslav Macedonia (Glutz von Blotzheim et al. (1971), Makatsch 1950; our observations 1979 and 1985 in the Babuna gorge, V. Mrlík and P. Žák, unpubl.). Long-legged Buzzards probably also bred in other sites in the former Yugoslavia. As early as 1979, we observed the species in the Rumija Mountains in Montenegro (V. Mrlík and P. Žák, unpubl.), from where no previous records were known (Anon 1996b). In recent years the species has been found in Serbia, where 12-15 pairs bred in 1993-1995 (first breeding was confirmed here in Jerma Gorge in 1990; Anon 1996b). In 1996 the Long-legged Buzzard was recorded for the first time as a breeding bird in the Romanian part of Dobruja and the total population is estimated here at 5-15 pairs (Schmitz 1999).

In Europe healthy breeding populations of Long-legged Buzzard exist in the European part of Russia and Bulgaria, with estimated breeding populations of 800-1,500 and 150-250 pairs (Galushin, Davygora & Moseikin in Tucker & Heath 1994). However, another recent estimate for Bulgaria puts the population c300 pairs (Munteanu, Todorov & Vatev in Hagemeijer & Blair 1997). The size of the total European population (excluding Russia) is estimated as 246-349 breeding pairs (Hagemeijer & Blair 1997).

In the last decades of the 20th century, Long-legged Buzzards have occurred more and more frequently and in greater numbers in Hungary, in the Great Hungarian Plain near Debrecen, Hortobágy, Szeged, Hódmezövásárhely, Csongrád, Apaj, Urbö and Kúnszentmiklós; some individuals have stayed year-round (Sterbetz 1960, Glutz von Blotzheim et al. (1971), Kovács 1992, Dudás, Kovács & Sándor 1993, Dudás & Sándor 1993). Key support for the idea that the species' range is expanding northwards came in 1992, when Long-legged Buzzard was first proven to nest in the northern parts of the Hortobágy. The birds nested on an artificial platform on a poplar and hatched one young (Anon 1994, Dudás & Sándor 1993). Second and third confirmed breeding records for the Hortobágy came in 1994 and 1995 (Anon 1996a). The species has also bred in the area in recent years. Successful nesting was confirmed in the eastern region of the Duna-Tisza Plains on the territory of the forthcoming Jászkarajeno Grasslands Landscape Protection Area in 1996 (Urbán et al. 1998). Long-legged Buzzards bred again in the Hortobágy in 1998. From a total of two breeding pairs, one was a mixed *Buteo buteo* and *Buteo rufinus* (G. Kovács pers. comm.). Probably interbreeding is more frequent in recent years (K. Róbert pers. comm.).

3.3 Possible preconditions for the expansion

Climatic change. The causes of spreading as well as of contraction of the distributions of many bird species have only recently been frequently mentioned in the literature. Some of these issues are often discussed in connection with global climate change (e.g. Sládek 1959, Aubrecht 1995, Moss 1998). A temperature rise is evident. For example, in the Czech-Moravian Highlands, a mean annual rise in temperature of 0.09 °C was recorded over the last eight years (1991-1999). Mean seasonal temperature has risen by as much as 0.17 °C during the last decade (1989-1999). Climate warming could thus be considered as one possible factor influencing the spread of the Long-legged Buzzard towards the northwest.

Extension of cultural steppe (grassland) areas. We believe that the artificial expansion of steppe areas, i.e. extensive fields of corn, maize, clover, alfalfa etc., by man could be a further factor for the recent expansion of the species. Steppe habitat is fully suitable for Long-legged Buzzards according to nesting possibilities, availability of food etc. (Glutz von Blotzheim et al. 1971, Cramp & Simmons 1980, del Hoyo et al. 1994).

Food availability. In association with global warming and the enlargement of cultural steppes, the densities and areas of steppe dwelling animals could have changed. Higher densities or more pronounced gradation phases of rodents form an extraordinarily good food supply for raptors. Vásvári (1939) considers trophic factors as very important for the expansion of the nesting range of the Eastern Imperial Eagle *(Aquila heliaca)* by the spreading of steppe rodents like Common Hamster (*Cricetus cricetus*) and European Suslik (*Spermophilus citellus*). Long-legged Buzzards prey upon reptiles, amphibians and large insects such as locusts, grasshoppers and beetles as well as small and medium-sized mammals and birds, e.g. hamster, susliks, voles, rabbits, hares, skylarks and partridges (Glutz von Blotzheim et al. 1971, Hudec & Černý 1977, Cramp & Simmons 1980, Burton 1989, Mebs 1994, del Hoyo et al. 1994). The potential food spectrum of the Long-legged Buzzard is thus broad, but susliks were the only recorded prey at the recent established nest sites in Hungary (Dudás & Sándor 1993). Adaptations to locally abundant prey species, e.g. voles and locusts can be assumed. According to the species' adaptability to local prey resources the expansion of its original prey species may be less important but detailed studies do not yet exist.

Summary

A healthy breeding population of Long-legged Buzzard exists in the Balkans. This population was more numerous in the past than usually described and has apparently been the source for an increasingly frequent appearance of the species in Central Europe. Glutz von Blotzheim et al. (1971) mentioned the expansion of the range into the northwest. They documented their statement with 178 records from Central European countries. However, the expansion was for a long time substantiated only by data from the non-breeding period. Central European records

from the breeding period are from the second half and from the end of the 20th century. Nesting outside the Balkans was confirmed for the first time in 1992 in Hungary (Dudás & Sándor 1993, Dudás, Kovács & Sándor1993). Here records from Austria (24) and the Czech and Slovak Republics (16) between 1980 and 1998 are presented. We compared recent data with those published earlier. We find a certain shift of the occurrence of Long-legged Buzzards in Central Europe from the winter and autumn months to the spring and summer period. Possible causes for the more frequent occurrence of the species in Central Europe are discussed. We believe that the expansion is caused by an increase of population numbers in the Balkans and climatic changes associated with global warming and the spreading of cultural steppe areas. Trophic factors seem less important.

References

Anonymus (1994): European News. Brit. Birds 87: 5.
Anonymus (1996a): European News. Brit. Birds 89: 30.
Anonymus (1996b): European News. Brit. Birds 89: 252.
Aubrecht, G. (1995): Eingewandert – Eingebürgert – Ausgekommen ? Unsere Vogelwelt wandelt sich. Stapfia 37, zugleich Kataloge des OÖ. Landesmuseums N.F. 84: 173-194.
Bejček, V., K. Šťastný & K. Hudec (1995): Atlas zimního rozšíření ptáků v České republice 1982-1985. Nakladatelství a vydavatelství H & H, Jinočany, 270 pp.
Bijleveld, M. (1974): Birds of Prey in Europe. Macmillan, London and Basingstoke, 263 pp.
Burton, P. (1989): Birds of Prey of the World. Dragon´s World, Limpsfield, San Sebastian, 208 pp.
Chytil, J. (1992): 2. zpráva České faunistické komise pro ornitologii. Zprávy ČSO 34: 17-22.
Chytil, J. (1995): 5. zpráva České faunistické komise ČSO. Zprávy ČSO 41: 17-20.
Chytil, J. (1997): Zpráva faunistické komise ČSO za období 1995-1996. Zprávy ČSO 45: 18-21.
Chytil, J. & M. Vavřík (1999): Zpráva Faunistické komise ČSO za období 1997-1998. Zprávy ČSO 49: 3-10.
Cramp, S. & K. Simmons (1980): Handbook of the Birds of Europe, the Middle East and North Africa. The Birds of the Western Palearctic, Vol. 2, Hawks to Bustards. The Oxford University Press, Oxford & New York, 695 pp.
Danko, Š. (1994): Správa o činnosti skupiny pre výskum a ochranu dravcov a sov v ČSFR za rok 1992. Buteo 6: 121-151.
Dudás, M. & I. Sándor (1993). Nesting of the Long-legged Buzzard *(Buteo rufinus)* in the Hortobágy. Aquila 100: 296-298.
Dudás, M`., Kovács, G. & I. Sándor (1993): Der Adlerbussard *Buteo rufinus* als mitteleuropäischer Brutvogel in der ungarischen Hortobágy-Pußta. Limicola 7: 141-146.
Ferianc, O. & Z. Feriancová-Masárová (1984): Jarný výskyt myšiaka hrdzavého, *Buteo rufinus* (Cretzch.) na Slovensku. Biológia 39: 1033.
Glutz von Blotzheim, U.N., K.M. Bauer & E. Bezzel (1971): Handbuch der Vögel Mitteleuropas, Bd. 4. Akad.Verlagsges., Frankfurt a. Main, 943 pp.
Hagemeijer, W.J.M. & M.J. Blair (Editors) (1997): The EBCC Atlas of European Breeding Birds: Their Distribution and Abundance. T & A D Poyser, London, 903 pp.

Hoyo, J. del, A. Elliot & J. Sargatal (Editors) (1994): Handbook of the Birds of the World, Vol. 2. Lynx Edicions, Barcelona, 638 pp.
Hudec, K. & W. Černý (1977): Fauna ČSSR, Ptáci - Aves, díl II. Academia, Praha, 893 pp.
Hudec, K., J. Chytil, K. Šťastný & V. Bejček (1995): The birds of the Czech Republic. Sylvia 31: 97-149.
Jirsík, J. (1941): Naši dravci. Tiskem O. Janáčka, Praha, 219 pp.
Kondělka, D. (1985): Výskyt káně bělochvosté *(Buteo rufinus)* v Severomoravském kraji. Čas. Slez. Muz. Opava 34: 288.
Kovács, G. (1992): Occurence of the Long-legged Buzzard *(Buteo rufinus)* in the Hortobágy between 1976 and 1991. Aquila 99: 41-48.
Laber, J. & A. Ranner (1997): Nachweise seltener und bemerkenswerter Vogelarten in Österreich 1991-1995. 2. Bericht der Avifaunistischen Kommission von BirdLife Österreich. Egretta 40: 1-44.
Maderič, B., Š. Mikiara & V. Pečenák (1995): Výskum populačnej hustoty dravcov v západnej časti okresu Humenné. Buteo 7: 169-172.
Makatsch, W. (1950): Die Vogelwelt Macedoniens. Akad. Verlagsges., Gees & Portig, Leipzig, 452 pp.
Mebs, T. (1989): Greifvögel Europas: Biologie, Bestandsverhältnisse, Bestandsgefährdung. Franckh, Stuttgart, 215 pp.
Mebs, T. (1994): Greifvögel Europas: Biologie, Bestandsverhältnisse, Bestandsgefährdung (erweitert und mit aktuellen Bestandszahlen). Franckh-Kosmos, Stuttgart, 246 pp.
Moss, S. (1998): Predictions of the effects of global climate change on Britain's birds. Brit. Birds 91: 307-325.
Musil, P. (1992): Ornitologická pozorování. Zprávy ČSO 34: 23-39.
Ranner, A., J. Laber & H.M. Berg (1995): Nachweise seltener und bemerkenswerter Vogelarten in Österreich 1980-1990. 1. Bericht der Avifaunistischen Kommission von BirdLife Österreich. Egretta 38: 59-98.
Schmitz, M. (1999): Status und Verbreitung des Adlerbussards *Buteo rufinus* in Rumänien. Limicola 13: 24-30.
Šimek, J. & P. Brandl (1999): Faunistická pozorování v České republice v roce 1998. Zprávy ČSO 48: 24-34.
Šírek, J. & J. Hudeček (1991): Pozorování káně bělochvosté (*Buteo rufinus* Cretzschm.) na střední Moravě Zpr. MOS 49: 163-164.
Sládek, J. (1959): Príčiny rozširovania areálu orla kráľovského *(Aquila heliaca)* v strednej Európe a jeho hniezdenie na Slovensku. Sylvia 16: 79-95.
Sládek, J. (1960): K výskytu myšiaka hrdzavého (*Buteo rufinus*) na Slovensku a metodické poznámky k jeho determinácii. Biológia 15: 928-933.
Štancl, L. & H. Štanclová (1996): První pozorování káně bělochvosté (*Buteo rufinus* CRETSCHM.) na Pardubicku. Vč.Sb.Přír. 4: 180.
Sterbetz, I. (1960): Der Adlerbussard in Ungarn. Orn. Mitt. 12: 187-198.
Štollmann, A. (1967): Myšiak hrdzavý (*Buteo rufinus*) na severnom Slovensku. Ochrana fauny 1(1-2): 35-37.
Trnka, A. (1997): Current list of birds of Slovakia. For the Slovak Rarities Committee of the Slovak Ornithological Society. Trnava, 76 pp.
Tucker, G.M. & M.F. Heath (1994): Birds in Europe: Their Conservation Status. BirdLife Conservation Series 3, Cambridge, 600 pp.
Urbán, S., G. Vasuta & T. Vincze (1998): Nesting of Long-legged Buzzard (*Buteo rufinus*) on Jászkarajeno. Aquila 103-104: 143.
Vasvári, M. (1939): Die Verbreitung und Ökologie des Kaiseradlers (*Aquila heliaca* SAV). Festschrift Prof. Dr. E. Strand, Vol. 5., Riga.

Zuna-Kratky, T., E. Kalivodová, A. Kürthy, D. Horal & P. Horák (2000): Die Vögel der March-Thaya-Auen im österreichisch-slowakisch-tschechischen Grenzraum. Distelverein. Deutsch-Wagram, 258 pp.

Authors´ address:

Vojtěch Mrlík *, Bedřich Landsfeld
Institute of Vertebrate Biology, Academy of Science of the Czech Republic
Květná 8, CZ-603 65 Brno,
Czech Republic
email: mrlik@brno.cas.cz
* Author to whom all correspondence should be sent