

## **Breeding distribution, population size, dynamics, ecology and protection of Montagu's Harrier *Circus pygargus* in the Czech Republic**

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### **Zusammenfassung**

Brutverbreitung, Populationsgrößen und -dynamik, Ökologie  
und Schutz der Wiesenweihe in Tschechien

In Tschechien kann die Wiesenweihe als regulärer Brutvogel angesehen werden, aktuell mit etwa 50 Brutpaaren, mit jährlichen Schwankungen von mindestens 3 bis 5 Paaren. Der Trend ist stabil; dennoch kann eine Abnahme nicht ausgeschlossen werden. Die Art wird als ständig bedroht in Tschechien eingestuft.

In den letzten Jahren (1991-2001) lagen die meisten Nester (88 %) in Agrarflächen, selten in halbnatürlichen Biotopen wie Trocken- und Feuchtwiesen und/oder Schilfflächen in Nachbarschaft von Fischteichen (n=90). Von 1991 bis 2001 war die bevorzugte Meereshöhe für Neststandorte unter 300 m (56 %); 20 % lagen zwischen 301 und 400 m, 24 % zwischen 401 und 500 m (n=50). In einem Einzelfall in 1978 kam es zu einer erfolgreichen Brut auf 610 m.

In Tschechien ist die Wiesenweihe meist ein Einzelbrüter. An wenigen Orten wurde gemeinschaftliches Nisten einiger Brutpaare registriert. Auf einer kleinen Fläche waren die Nester mindestens 15 m getrennt; die "Kolonie" überstieg nicht 4 Brutpaare.

Unsere Langzeiteinschätzung des Bruterfolges ist 1,5 Junge pro angefangener Brut (n=151) oder 2,9 Junge pro erfolgreiche Brut (n=80, 1929-2001). Nach unserer Erfahrung sind Brutaufgaben häufiger durch natürliche Verluste bedingt (70 %) als durch den Menschen verursachte (n=54). Die meisten natürlichen Verluste schließen Zerstörung der Nester durch Bodenraubtiere und verlassene Gelege ein. Menschliche Ursachen waren Zerstörung der Eier oder Jungen, Töten (Abschuss) einer oder beider Brutpartner und Zerstörung der Nester während der (maschinellen) Ernte.

Schutz einzelner Nester ist nicht ohne die Zusammenarbeit mit den Landbesitzern (Bauern, Teichwirten) möglich. Um Verluste durch Bodenräuber zu vermeiden, empfehlen wir abstoßende Substanzen wie Karbolsäure oder Naphthalin an besetzten Nestern. Weitere Schutzmaßnahmen werden diskutiert.

### **Introduction**

The first note on the breeding of Montagu's Harrier in our territory dates from 1873 when the species is said to have bred near Rumburk in northern Bohemia (LOKAJ in FRIČ 1873 in HUDEC & ČERNÝ 1977). Subsequent assumed breeding near Putim,

Heřmaň and Talín in southern Bohemia date from 1882 (VAŘEČKA 1895 in HUDEC & ČERNÝ 1977). From the same year also dates the finding of the first nest of Montagu's Harrier near Strážnice in southern Moravia (TALSKÝ 1885 in HUDEC & ČERNÝ 1977).

As suggested by the historical data, this raptor species was never abundant in our territory. It has remained a sparse breeder until present and its population size shows considerable year-to-year fluctuation. In view of our knowledge of its breeding dis-

tribution, population size and dynamics, behaviour and ecology, Montagu's Harrier can be considered to be permanently threatened in the territory of the Czech Republic.

### Material and methods

We have succeeded in collecting data on 258 cases of confirmed or probable breeding of Montagu's Harrier in the territory of the Czech Republic. The data fall into the period between 1873 and present. Most nests have been recorded in 1998 and 2001, 22 and 16 nests respectively. Our work inherited in analysing the available literary data, the hitherto unpublished ones pro-

vided by some of the specialists, and our own unpublished records. Despite the fact that we have endeavoured to collect maximum available information on this raptor species, it is evident that we have still failed to get some of the data, or have not utilised them in our final evaluation for some reason or other.

### Results

#### A: Important breeding areas

At present, 10 localities may be considered to be important breeding areas of Montagu's Harrier in the Czech Republic. There are two major reasons why they are important. (1) the Harriers have bred in them continuously (or with rather short intervals) for several years in succession; and (2) usually a larger number of pairs will breed there. The localities lie in the wider environs of the following villages and towns: (1) Uničov (0-9) 6167, 6168, 6169, 6069; (2) Olomouc (0-5) 6268, 6269, 6369, 6469; (3) Opava (0-8) 6072, 6073, 6074, 6174; (4) Dobříš (1-4) 6249, 6349; (5) Sedlčany (0-2) 6252, 6351, 6352; (7) Znojmo (1-5) 7062; (8) Moravské Budějovice (1-2) 6861; (9) Pohořelice (0-3) 7064, 7164; (10) Třeboň (0-3) 6753, 6853, 6954. (The numbers in brackets indicate numbers of breeding pairs and reflect the fluctuation in breeding population size; the numbers consist-

ing of four digits indicate concrete numbers of quadrats of the unified mapping grid, and they define the area of 12 by 11.1 km, i.e. 133.2 km<sup>2</sup> (the unified network of quadrats 10 L. by 6 Lat. in size), also used to map the distribution of all living organisms in the Czech Republic (ŠTĀSTNÝ, BEJČEK & HUDEC 1996)

#### B: Population size in the past and at present

It can be stated that during the past 100 odd years, in which Montagu's Harriers have been demonstrated to breed in our territory, the size of the breeding population has been small but relatively stable. From the period under evaluation, i.e. 1873 until present, we still lack data on the breeding of this species in 1874-1881, 1883-1884, 1887-1890, 1892, 1894-1928, 1930-1936, 1938-1942, 1944, 1952-1954, 1957, 1959, 1961 and 1966-1967. Starting in 1968, the breed-

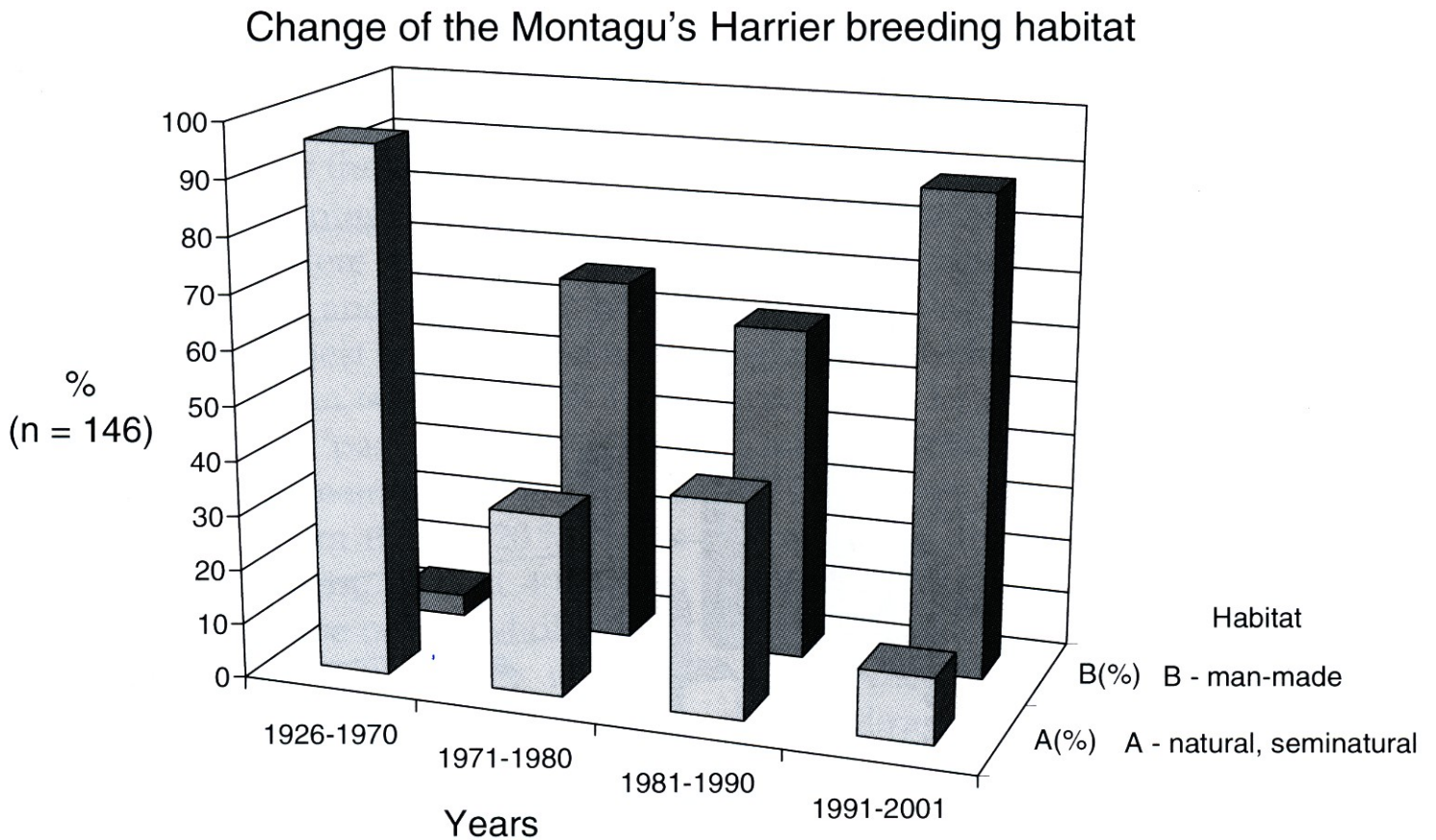


Fig. 1: Change of Montagu's Harrier breeding habitat from natural to man-made, 1926 to 2001.  
 – Abb. 1: Änderung der bevorzugten Nistplatzwahl der Wiesenweihe in Tschechien von natürlich zu menschengemacht, 1926 bis 2001.

ing of Montagu's Harrier has been recorded every year. However, even in the years from which any data are missing, small numbers of Montagu's Harriers can be assumed to have bred in our territory. At least, one may assume so with respect to the quality of field ornithology of those times, the level of knowledge, the total number of specialists and, above all, the often very difficult conditions of human life.

As stated above, the breeding of 1 to 22 pairs of Montagu's Harriers has been recorded every year from 1968 until 2001. Since 1990, their number did not drop below 3 pairs (1991) in any one year. Thus, it is assumed that the size of the breeding population has shown long-term year-to-year fluctuation from min. 3 (5) to max. 50 pairs. This assumption may be considered valid even at present. With regard to the breeding success of pairs breeding every year and to the overall size of the breeding

population, the population trend is considered to be stable, similarly as stated in the earlier literature (stable trend = overall change less than 20%, HUDEC et al. 1995).

### C: Nest site selection

As seen in Fig. 1, in the early 20th century, Montagu's Harriers's nests were preferably situated in natural or semi-natural habitats. Such habitats may have included wetlands, reeds, wet meadows and forest clearings. In 1926-1970, 96% of the pairs nested in that way (n=23). A concrete change in nest site selection may be observed in the 1975-1980 period. At that time the Harriers showed increased preference for situating their nests in considerably altered, so-called "artificial" habitats that were considerably exploited by man (small and limited wetlands among fields (wetspot), field crops such as wheat, barley, rye and oats, large-scale winter rape

### Altitude of the Montagu's Harrier nest sites

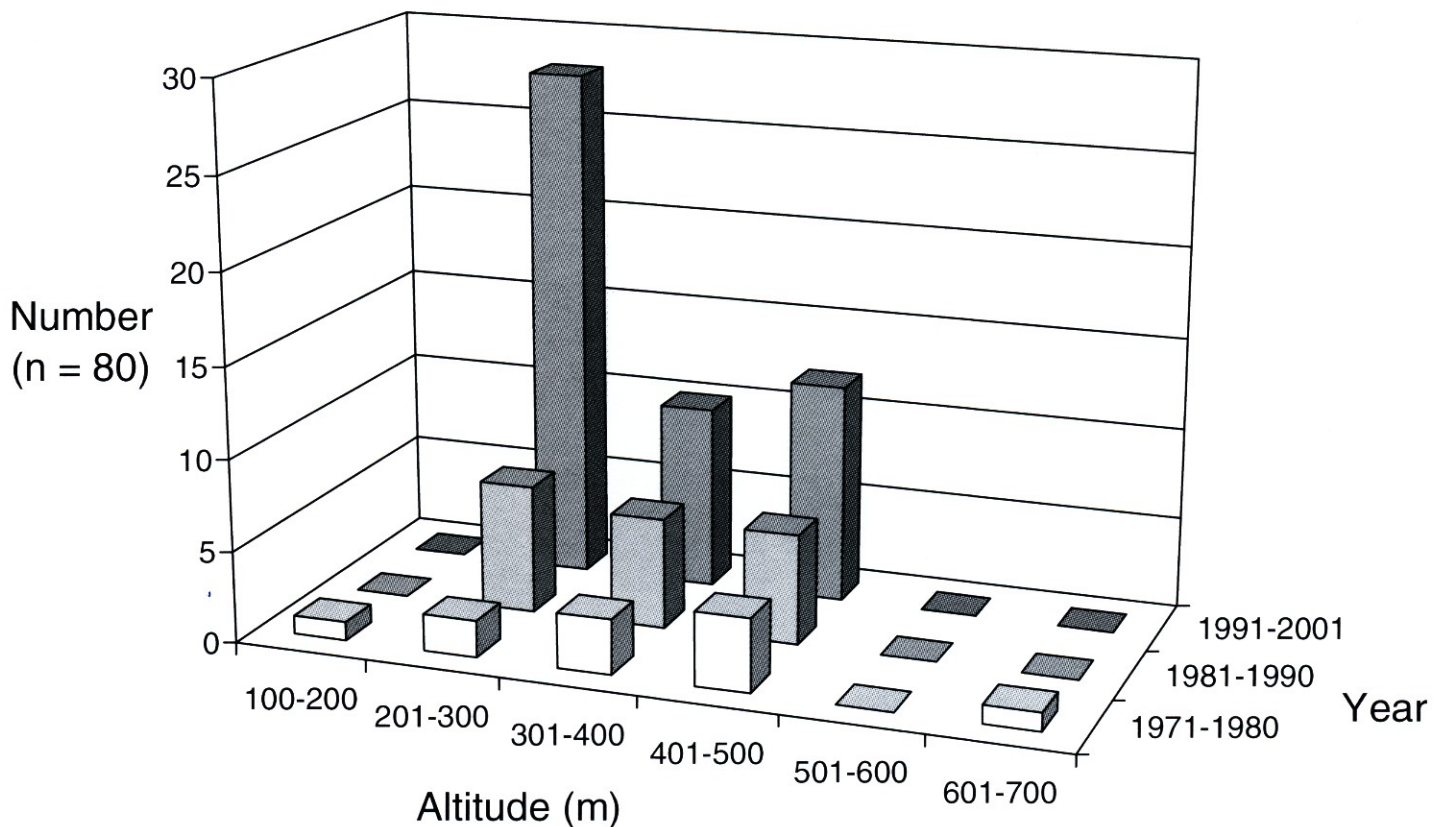


Fig. 2: Altitude of Montagu's Harrier nest sites. – Abb. 2: Meereshöhe der Brutplätze der Wiesenweihes in Tschechien.

and lucerne crops). In 1971-1980, 67% of detected Montagu's Harrier's nests ( $n = 15$ ) were found in such sites. In recent years (1991-2001) the situation was still more marked, since 88% of the nests were situated in such places (wetspots 1%, lucerne 11%, rape 2%, cereals 73%,  $n = 90$ ). Only a small part of the breeding population (13 pairs) placed their nests in the previously preferred nest sites in wetlands and wet meadows.

In the Czech Republic, Montagu's Harrier has been a solitary breeder, or breeder in small colonies. As a rule, the distance between any two breeding pairs amounts to several kilometres. However, in some of the breeding localities a certain regularity is observed in the nests of several breeding pairs being congregated in a rather small area. In such cases the nests may be only tens of meters apart. While the information on such cases is rather scant (in recent years more frequently), they have occurred

in several localities in the Czech Republic. In the environs of Uničov (northern Moravia), the nests of up to four pairs have been found to be at most 30 m apart (POPRACH in litt., SUCHÝ 1994, SUCHÝ in press). Colonies of 2-3 pairs have also been reported from southern Bohemia (HLÁSEK 1987), colonies of 2-5 pairs from central and southern Moravia (surrounding of Olomouc and Znojmo, POPRACH in litt.). Joint colonial breeding of four pairs of Montagu's Harriers with two pairs of Marsh Harriers in a wetland 1 ha in size is known from eastern Bohemia in 2001. The nests of Montagu's Harriers have been found to be at most 15 m apart here, the distance between Montagu's and Marsh Harriers nests was 30 m (PETERA in litt.).

In the conditions of the Czech Republic, a tendency has often been mentioned for Montagu's Harrier to nest below the elevation of 400 m (e.g., HUDEC & ČERNÝ 1977, ŠTASTNÝ, RANDÍK & HUDEC 1987, MARTIŠKO

1994). However, the harriers have rather frequently nested in higher altitudes as well (Fig. 2). In 1974-2001, 71% of nests were situated below the elevation of 400 m ( $n=80$ ). The remaining, relatively large, number of nests were situated at elevations between 401 and 500 m (22 nests, 28%) and a single nest was situated at an elevation higher than 600 m (KORBA 1979, ČECH 1981). In the past 11 years (1991-2001), an absolute majority of nests were situated below 300 m (56%). 20% of the nests lay at 301-400 m, 24% at 401-500 m ( $n=50$ ). In the course of the whole study period (1971-2001) a tendency was observed for a rapid increase in the number of nests situated at elevations between 201 and 300 m from 18% in 1971-1980 ( $n=11$ ) to 56% in 1991-2001 ( $n=50$ ), while the percentage in 401-500 m dropped from 37 to 24% respectively.

#### D: Breeding success and protection

The results of breeding are available for 151 cases observed during 1929-2001. Surprisingly, not a single young fledged in 47% of them. A total of 232 young did fledge in the remaining 80 cases. In 13% of them, one young fledged; two young in 20%; three young in 40%; four young in 21%, five in 5%; and six in 1% ( $n=80$ ). On a long-term basis, the average breeding success was 1.5 young fledged per commenced breeding ( $n=151$ ), or 2.9 young fledged per successful breeding ( $n=80$ ).

Cases of breeding failure were studied in 54 unsuccessful cases. Natural losses account for 70% ( $n=54$ ). A terrestrial predator destroyed the clutches 14 times, and clutches were abandoned 10 times. Other causes of failure included addled eggs (4 times), unfavourable weather (twice), lack of food (twice), fly maggot invasion (once) and in five cases the natural cause

of breeding failure was uncertain. Man-made losses (30%,  $n=54$ ) included destruction of eggs or young (6 times), shooting one or both breeding partners (5 times), and destruction of the nest during crop harvest (5 times).

In the Czech Republic, the protection of Montagu's Harrier nests is primarily directed to keep natural losses or those caused by nest destruction during harvest of field crops low. The methods of protection can be defined as follows:

- active protection, essential in all cases of nests situated in field crops (cereal fields, rape, lucerne and cultivated meadows);
- discouraging the birds from breeding where it was repeatedly unsuccessful, using scarecrows (near villages, roads, in lucerne);
- finding and staking out (marking) the nest site, the area at least 5 by 5 m in size, or preferably larger, up to 50 by 50 m);
- forming a ring of big sticks (tree limbs) around the nest to prevent nest destruction by cereals lodged after a heavy rain;
- communicating the find of a nest to the land owner and making agreement on its protection;
- postponing the harvest of the crop until the post-fledging dependence period;
- saving the staked-out area;
- transferring the young to a safe place at the following distances: young over two weeks of age, a single transfer to a place 500 m away (this has been verified to be successful); young less than two weeks of age, step-wise transfer, each step 50 m away;
- preventing terrestrial predators (fox, polecat, marten, etc.) from preying upon the young by placing scent repellents at a distance of 1 m near the nest; good results have been obtained with applying naphthalene tablets or plastic bottles half-filled with phenol, or with spilled car oil;

- other methods: transferring the young to be adopted in a nest of a Marsh Harrier or in another nest of Montagu's Harrier, provided that they contain young of approximately the same age.

Note: It is essential for successful breeding of Montagu's Harriers that there be a high

proportion of perennial legumes (lucerne, clover) and grassland among the crops surrounding the nest site; such crops usually harbour numerous populations of small terrestrial rodents, above all, voles (*Microtus arvalis*), which are important sources of food for raptors.

### Conclusions

- *Circus pygargus* is a regular but scarce breeder in the territory of the Czech Republic since 1882.
- The breeding population size of this raptor species shows considerable year-to-year fluctuation.
- In this country there are ten important breeding areas in which the breeding population size fluctuates from 3(5) to 40 pairs.
- 80 % of pairs concentrate for breeding in the important areas. Sporadically, 20 % of pairs breed outside the important breeding areas.
- The total breeding population size is estimated at a maximum of 50 pairs.
- The present development of the breeding population follows a stable trend

- but a decline or even an overall collapse cannot be excluded.
- At present, a shift is observed in the selection of nesting habitats from natural or semi-natural habitat types towards man-made cultivated steppe (extensive field crops).
- 88 % of pairs now breed in arable land; this habitat preference has been observed since 1975-1980.
- It is necessary to protect all Montagu's Harrier nests situated in field crops (cereals, rape, lucerne) and other farmland (cultivated meadows).
- The methods of protecting the nests, mentioned in the text, have been tested and mostly found successful.

### Abstract

Montagu's Harrier can be classified as a species regularly breeding in the Czech Republic, with the actual population size of about 50 pairs, but the breeding population size shows considerable year-to-year fluctuation (min. 3-5 pairs). It is a raptor species with a stable population trend, yet a decline cannot be excluded. The species can be considered to be permanently threatened in the territory of the Czech Republic.

In recent years (1991-2001), most nests have been situated in agricultural landscapes (88 %), rarely in semi-natural habitats such as dry or wet grasslands, meadows and/or reeds in the

vicinity of fish-ponds (n=90). In the past 11 years (1991-2001) the preferred altitude for nest sites was below 300 m (56 %). 20 % of the nests were situated at elevations of 301-400 m, and 24 % at 401-500 m (n=50). In a single case, Montagu's Harrier nested successfully at an elevation of 610 m (in 1978). In the Czech Republic, Montagu's Harrier is mainly a solitary breeder. Rarely, gregarious nesting of several breeding pairs was registered in some localities. In a rather small area, their nests were at least 15 m apart, and invariably the colony did not exceed 4 pairs. Our long-term estimate of the average breeding success is 1.5 young per

commenced breeding (n=151), or 2.9 young per successful nesting (n=80, 1929-2001). In our experience, unsuccessful nests are more frequently due to natural losses (70 %) than to man-made ones (n=54). Most of the natural losses include nests destroyed by terrestrial predators, and abandoned clutches. The man-made losses included destroyed eggs or young, one or both breeding partners killed (shot), and

nests destroyed during harvest of field crops.

Protection of individual nests of these raptors needs, above all, co-operation with land owners (farmers, fish-pond managers). To prevent losses caused by terrestrial predators it is advisable to apply such repellents as carbolic acid or naphthalene to occupied nests. Further ways of protection are discussed.

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