

Guideline on Measures to Secure the Successful Wintering of Great Bustards



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1. Introduction

The First Meeting of the Signatory States of the MoU (Illmitz, Austria, 17-18 September, 2004) adopted the first Medium Term International Work Programme (MTIWP) for the period of 2005–2010 on the conservation and management of the Middle-European population of the Great Bustard. The update of the MTIWP has been on the agenda of the Meeting of Signatories ever since.

- 1) The MTIWP defined *inter alia* the preparation of guidelines on species and habitat conservation measures to be implemented on the wintering sites in Middle-Europe to secure successful wintering of Great Bustard populations. This paper is based on experiences gained regarding the populations in the Carpathian Basin, mostly in Hungary.
- 2) The present document gives a draft summary of the weather conditions, the problems encountered and the conservation measures for the management of Great Bustard populations concerning the objectives mentioned above.

2. Measures to be taken in the Carpathian Basin

2.1. Winter climates in Central Europe

The winter weather conditions significantly vary in the Carpathian Basin and in the whole Middle-European region year by year. These differences were becoming more significant in the last decades due to climate change.

The changing weather conditions affect both the wintering and the migratory behaviour of Great Bustard populations in general, and can result in developing unique survival strategies each winter.

Regarding weather conditions, we can identify three main types of winter weather, as follows:

- 1) Unusually **mild weather** conditions during nearly the whole winter, with or without a little snow cover.
- 2) **Normal winter** conditions with only one or a few (but always short) cold periods with daily temperatures above or equal to -10 °C, and occasionally with thin (5-10 cm) snow cover.
- 3) **Harsh or severe winters** with 2 or 3 weeks of cold periods (minimum daily temperatures below -15 or -20 °C). The circumstances will worsen with deep (over 20 cm) and long-lasting snow cover.



In harsh winter conditions the frozen surface prevents access to winter vegetation

2.2. Migratory behaviour in different weather conditions

The Great Bustard is a partial migrant bird species. Its migratory behaviour is determined by winter weather conditions.

1-2) **In mild and normal winters** the Great Bustard populations in Hungary do not migrate, they remain at their breeding areas and behave as a sedentary species, or they migrate very short distances. The direction of their migration route is mostly east to west and is not more than 50–150 km. They rarely move southwards or beyond the national borders.

This phenomenon is presumably caused by a climatic gradient (in the east–west direction) as follows: the winter climate in the area east of River Tisza is more continental, and is usually an average 1-2°C colder than in the Kiskunság in the central part of the country or the areas further west. This climatic variance sometimes causes the difference in the migratory behaviour of the populations in the central and the eastern areas.

3) **In severe winters** parts of the Great Bustard populations may migrate to Southern Europe, to the Balkan Peninsula or to Italy, but this can usually be prevented with conservation measures. Such migration did not take place in the Hungarian population in the last 20 years.

If the longer cold period accompanied by deep snow cover occurs in December or January, the probability of migration (or partial migration) of Great Bustard groups becomes higher. However, closer to the breeding season in February, when the moustache, a sign of the beginning of the breeding period of the adult males, starts to

grow, they are more reluctant to move away. As the motivation for bigger movements becomes lower and lower, they try to survive at their normal breeding sites.

2.3. Management activities

2.3.1. Preliminary establishment of wintering grounds

There are a number of uncertainties in migration characteristics, therefore the careful preparation of Great Bustard wintering sites and the timely planning of the management are very important for successful wintering.

Even though the winters are getting milder, **weather conditions can also be unpredictable**, so it is important to take measures of precaution to ensure the availability of adequate and sufficient winter food. It is necessary to encourage the farming sector to plan the location of the different plant cultures and eventually to sow the plant seeds and establish these plots already at the end of the previous summer in order to provide larger fields in the optimal wintering areas.

The main winter food for the Great Bustard is the green leaves of the oilseed rape (*Brassica napus*) sown in autumn. Alfalfa (*Medicago sativa*) is a favourable crop especially late autumn and early spring; both the leaves of the plants and the high density of rodents, insects and other invertebrates make it attractive to Great Bustards. Savoy cabbage (*Brassica oleracea var. sabauda*) can serve as an alternative winter food supply throughout the winter months in regions where it is grown. The damage Great Bustards cause to farmers can be mitigated by monitoring the flocks and communicating with the farmers to determine the level of dependence of the birds on the crops.

The local daily movement between the feeding and the roosting sites may result in heightened risk for collision with power lines. Wintering grounds (oilseed rape fields) should be created far from medium- and high-voltage power lines, and railway catenaries.



Fields with well-developed leaves of oilseed rape is most commonly used by Great Bustards as wintering sites in Central Europe

In some regions the oilseed rape is grown on relatively large scale as part of conventional farming. Due to climatic changes, especially the unpredictable amount of precipitation resulted in shifting the crop rotation from sunflower to oilseed rape in some cases. Additionally, the high proportion of chemicals used during its intensive growing has many side effects to game species (e.g. Roe Deer and European Brown Hare) and possibly on Great Bustards.

Regions like Hungary, where the ratio of crops grown significantly changed by the growth of oilseed rape and arable lands are managed according to Great Bustard conservation measures, should focus rather on ensuring the breeding success than improving wintering conditions.

Besides the large plots of oilseed rape, **alternative feeding plots** should also be established in the vicinity as secondary or tertiary wintering parcels, in case of disturbance by eagles and inappropriate hunting or agricultural, or any other human activities.

Alternative crops for resting and feeding on wintering grounds may be alfalfa, as mentioned above.

Savoy cabbage is harvested from the field gradually. As it is an easily accessible and nutritious winter food source, it is always worth scanning the cabbage fields thoroughly for wintering Great Bustard flocks. Even the remaining leaves of the harvested cabbage are attractive to the birds.



Great Bustards visit Savoy cabbage fields regularly in harsh weather conditions

Furthermore, the oilseed rape, alfalfa and alternatively, remaining cabbage cultures, along with the natural grasslands can be ideal habitats for small rodents serving as a rich protein source, which is especially important for the Great Bustard in cold winter days. In wintertime the most important rodent is the Common Vole (*Microtus arvalis*) as it is active in daylight, too. In autumn and early spring the Mound-building Mouse (*Mus spicilegus*) and the Wood Mouse (*Apodemus sylvaticus*) are also important food sources. The latter two are nocturnal animals, but sometimes come out of their burrows in daytime as well.

Other crops grown as historical alternatives of oilseed rape

- Plants of the cabbage family (*Brassicaceae*) had been planted and used as a winter food source since the 1970s, when the Kiskunság National Park was established. The cabbage was planted around the edges of some of the ploughed fields in one or two rows. The cabbage, using other varieties, remained as an alternative food supply ever since. Its stem grows high enough above the snow cover so the Great Bustard has access to the leaves.
 - Nowadays the remaining stubblefield of cabbages are used by Great Bustard as alternative feeding grounds.
- In those experimental years in the 1970s, another plant, the common sainfoin (*Onobrychis viciifolia*) was also planted in a small sample area within the Kiskunság National Park. The Great Bustards accepted this culture not only in winter, but also in summer. The *Onobrychis* field existed for 6 years.
 - Nowadays common sainfoin is rarely sown; alfalfa is the most common perennial crop in Great Bustard habitats.

Disturbance as a threat of the Middle-European Great Bustard populations can multiply the chance for collision. Natural threats include the presence of eagle species

(White-tailed Eagle, Imperial Eagle and Golden Eagle), while human disturbance is often related to hunting activities, like driven hunt, or technical sports.

2.3.2. Management during winter

Agrarian habitats as wintering grounds: habitat management recommendations are compiled in “Guideline for the different Agri-Environmental schemes for the benefit of the Great Bustard (*Otis tarda*) UNEP/CMS/GB/MOS5/Doc.7.3.”

Description

The main winter food of the Central European Great Bustards is the leaves of the oilseed rape, sown in autumn. Alternative feeding sites can be alfalfa or Savoy cabbage plots.

Wintering grounds - normally the sites traditionally used by the birds, but the choice of certain plots is influenced by the actual conditions and the crop rotation of the site - should be managed in line with the following **criteria**:

- Large open areas with undulating landscape, where suitable feeding sites, such as oilseed rape fields are available, and human disturbance is low (principle wintering ground).
- Alternative feeding plots are also present in the vicinity in case of disturbance, like hunting, touristic, sport or agricultural activities (secondary and tertiary wintering ground).
- Suitable, undisturbed roosting sites can be found in the vicinity with low vegetation, from where approaching the feeding sites is easy.



Technical sports as a factor of disturbance on Great Bustard wintering grounds

Recommendation on management

The management of wintering grounds should cover the management of feeding sites, roosting sites (which are commonly display or nesting sites as well) and also the regular monitoring of the wintering flocks.

The management of **feeding sites** is primarily based on the establishment of one or more oilseed rape plots within or in the vicinity of the traditional wintering grounds. As the seeds of the oilseed rape are small, the first and very important step is the optimal preparation of the soil before sowing. Also the timing of sowing has an effect on the quality of the leaves. In Central Europe, the oilseed rape is sown in late August or early September. If sown in time, the plants can spring forth and have time to grow big enough to be able to last all winter and offer suitable nutrition for the Great Bustards. The overgrowth of the weeds often causes problems by reducing the viability of the oilseed rape plants. To avoid this, application of weed-killers might be needed in autumn.

Beside the fact that the plots should be undisturbed, open and possibly a bit undulating areas, the presence of various relief elements for **shelter** to the birds against strong wind or heavy snowfall can be important. Thanks to the relief, there will be always snowless, bare patches, where the Great Bustards can find the leaves of oilseed rape.

In case of harsh winters with thick snow cover, the **cleaning** of feeding sites is needed to avoid movements of the birds and keep them in a well-watched and safe location. If the access for leaves is not ensured, the unpredictable movements might cause unpredictable losses to the Central European Great Bustard population.

Cleaning can be done by the use of snow-plough connected to a tractor, or simply by pulling 2 or 3 large tires by a tractor or even by a 4-wheel-drive vehicle. Normally 1 or 2 hectares are enough to clean for a while, but it depends on the size of the flock and the weather conditions. In such weather conditions, daily monitoring is an obligatory side-measure. According to the monitoring results this activity might need to be repeated, until the weather conditions turn better.

Opening the snow cover on rape fields can happen in natural ways, too. When the snow is not too thick, Roe Deer (*Capreolus capreolus*), regularly forming a „feeding community” with the Great Bustards, scratch the surface of the snow cover with their hooves.



Proper way of opening up the snow cover on a rape field by machines

It is recommended to include the obligation in the contract as a prescription for the farmers to open up the snow cover on the rape fields in order to make feeding possible for the wintering Great Bustard flocks. See the “*Guideline for the different Agri-Environmental Schemes for the benefit of the Great Bustard (Otis tarda)*” - (UNEP/CMS/GB/MOS5/Doc.7.3.) for reference.

2.3.3. Winter counts and monitoring based on behaviour

Once the plots are created and occupied by the birds, regular **monitoring** of the wintering flocks and weather conditions is necessary. Due to the predictable daily movements of the birds and the well-known plots normally used by Great Bustards, winter counts can be carried out at feeding or at roosting sites. It is much easier to count while the birds are feeding, especially if the vegetation is covered with snow.

In the wintertime the movements and behaviour of Great Bustards, apart from extreme weather conditions, are relatively well predictable. A regular and more or less simple daily routine for the birds consists of visiting the feeding sites (if not roosting on them) in the morning, spending the whole day with feeding, then in late afternoon flying (or sometimes just walking) back to the roosting sites.

On **mild days** the Great Bustards regularly visit the plots of perennial crops, especially grasslands and alfalfa fields for resting around mid-day. These plots often serve as roosting sites as well. One of the reasons that the birds tend to “have a rest” at these sites is the fact that when the temperature gets higher, their feet can get stuck in the mud, which makes walking difficult. The other reason is that various food supplies are offered by these habitats, as there is a good opportunity to find insects or smaller rodents on warmer days during winter months.



If winter food supply is not guaranteed, Great Bustard flocks may leave the habitats and migrate to other areas

On **harsh winters**, when the leaves of the oilseed rape have thick snow cover, or when the snow is frozen on the surface, it is difficult for the birds to get to the food source. In these cases, especially if these conditions last for several days or weeks, the birds can easily move longer distances, where the weather conditions are milder. For Central

European Great Bustards, as they are not obligatory, but partial migrants, it can result in movements even to the Mediterranean. The losses encountered during migration can have a negative impact on the entire breeding population.

According to the experiences, by the **end of winter** (January or February), when the moustache, the obvious sign of the beginning of mating season of the adult males starts to grow as a result of the body moult, the motivation for larger movements becomes lower and lower. The birds normally stay sedentary even if the end of the winter or the early spring weather turns severe, but there are some exceptions, as it happened in the past.

As these occasional movements are usually unknown, following our best practice, regular monitoring and carrying out further research are the principles of management activities.

2.3.4. Extra food supply

In **mild and normal winter** circumstances, when the minimum temperature is seldom below -5°C , the Great Bustard populations usually stay on their regular wintering sites which are the same as their breeding sites or are situated nearby. In case of mild winter weather it is not necessary to help the birds with direct food supply, it is enough to ensure the non-disturbance of the wintering habitats. In that case they can also use the natural vegetation and to a smaller extent, the invertebrate fauna to feed. As noted, the most frequently used wintering habitats are the rape fields used for feeding and the grasslands and alfalfa mostly as resting sites.

In case of **harsh winters**, when the leaves of the oilseed rape have thick snow cover, or when the snow is frozen on the surface, it is difficult for the birds to get to the food. In these cases, especially if these conditions last for several days or weeks, we have to supply extra food sources and must ensure access to winter vegetation for the wintering Great Bustards!

In case of thick snow cover, cattle **silage** is put out in the fields in small piles. The silage is usually made from the green parts of maize (*Zea mays*) providing winter food for the Great Bustard in the cold periods. In Kiskunság National Park it has been in practice since the 1970s, followed later by all national parks in Hungary. Beside maize, green Savoy cabbage, good quality hay of dry alfalfa and a seed-mixture consisting of broken wheat, maize, sunflower and different weed seeds are also adequate and are regularly used as winter foods.



Providing winter food supply by putting out silage (dried alfalfa) for the birds

3. Measures to be taken outside the Carpathian Basin and the North German Plain

Questions to consider:

- What can we do when the Great Bustard population has already left and they are on their migration routes?
- What happens when the Great Bustards arrive at their wintering place in one of the countries in Southern or Western Europe?
- How do and/or should Range States ensure the adequate protection of the individuals or populations e.g from any disturbance, such as hunting activities?
- Do the authorised bodies ensure the lowest level of disturbance possible of the habitats where Great Bustard individuals settle temporarily on their migration route?

Recommended measures to be taken in advance to reduce losses during migration over longer distances:

- Tagging birds in most sub-populations in the Carpathian Basin to gain data of movements of individuals or flocks.
- Regular monitoring of Great Bustards and alerting Range States in emergency situations.

Measures to be taken in case of movements out of range:

1. Inform the parties of the Great Bustard MoU via CMS Secretariat and also directly (calls, e-mails), providing information about:
 - a. the exact location of birds
 - b. the number of birds and flocks

2. Assess the situation focusing on available food and risk factors:
 - a. nearby power lines
 - b. potential disturbances (hunting, birdwatchers, technical sports, etc.)
 - c. any other significant factors
3. Inform the parties about possibilities of regular monitoring options and tools, especially on personnel available for the required monitoring activities

See item 1.1.2 of the Medium Term International Work Programme adopted at MOS5 in Bratislava, Slovakia, 20-21 September 2023.

4. References

- *Anda, A. & Dunkel, Z. (2000):* Agrometeorológia (in Hungarian) / Agrometeorology (university course book) - VE-GMK, Keszthely.
- *Bankovics, András (2009):* Conservation of Otis tarda in Hungary.- *LIFE Project Final Report.* (manuscript).- Directorate of Kiskunság National Park, Kecskemét.
- *Bankovics, A. (1996):* A túzok (*Otis tarda* L. 1758) állományának növekedése a Kiskunsági Nemzeti Parkban.- (in Hungarian) /Population increasing of Great Bustard (*Otis tarda* L. 1758) in the Kiskunság National Park./ *Állattani Közlemények* **81**, p. 3-8.
- *Bankovics, A. (1997):* A túzok (*Otis tarda* L. 1758) természetvédelmi kezelése kiskunsági élőhelyein.- (in Hungarian) /Conservation Management of the Great Bustard (*Otis tarda* L. 1758) in its habitats in Kiskunság.- *Természetvédelmi Közlemények* **5-6**: 87-92.
- *Bankovics, A. (2005):* A General Overview of the Threats of Hungarian Great Bustards (*Otis tarda*).- *Aquila* **112**, p. 135-142.
- *Faragó, S. (1990):* A kemény telek hatása Magyarország túzok (*Otis tarda* L.) állományára.- *Állattani Közlemények* **76**, p. 51-62.
- *Faragó, S. (1990):* A túzok Magyarországon.- Venatus, Budapest, 78 p.
- *Nagy, Szabolcs (2018):* International Single-species Action Plan for the Western Palaearctic Population of Great Bustard, *Otis tarda tarda*. Version adapted for the Memorandum of Understanding on the Conservation and Management of the Middle-European Population of the Great Bustard (*Otis tarda*).
- *Streich, Wolf Jürgen & Litzbarski, Heinz & Ludwig, Bernd & Ludwig, Stefan. (2006).* What triggers facultative winter migration of Great Bustard (*Otis tarda*) in Central Europe?. *Eur. J. Wildl. Res.* **52**, p. 48-53. 10.1007/s10344-005-0007-1.
- *Széll, A. (2013):* A túzok telelésével kapcsolatos tapasztalatok (Hungarian) - Experiences on wintering of Great Bustard.- (manuscript)