# **Fifth Meeting of the Signatories**

**of the Memorandum of Understanding on the Conservation and Management of the Middle-European Population of the Great Bustard (*Otis tarda*)**

*Bratislava, Slovakia, 18 – 21 September 2023*

UNEP/CMS/GB/MOS5/Doc.6.2-IN-SESSION

**REVIEW of the MOU’s Action Plan**

**“International Single-Species Action Plan for the Western Palaearctic Population of Great Bustard, *Otis tarda tarda*”**

1. The Action Plan annexed to the Memorandum of Understanding on the Conservation and Management of the Middle-European Population of the Great Bustard (*Otis tarda*) is an integral part thereof.
2. The *International Single-Species Action Plan for the Western Palaearctic Population of Great Bustard, Otis tarda tarda* was commissioned by the European Commission and prepared by BirdLife International as subcontractor to the “N2K Group” in the framework of Service Contract N#070307/2007/488316/SER/B2 “Technical and scientific support in relation to the implementation of the 92/43 ‘Habitats’ and 79/409 ‘Birds’ Directives”. The current ‘MOU-version’ resulted from an update and alignment of that Action Plan. It was prepared and adopted to serve as the Action Plan for the CMS Memorandum of Understanding on the Conservation and Management of the Middle-European Population of the Great Bustard at the 4th Meeting of the Signatories, held in Bad Belzig, Germany in March 2018.
3. The present Action Plan (see Annex of this document) covers the Range States that the Action Plan should apply to in order to cover the objectives of the MOU. Any additional information or possible further action to be taken may be considered, together with the consideration of any action deemed not to be relevant to the Signatories and the geographical scope of the MOU.
4. In line with clause 13 of the MOU Text, the meeting is recommended to discuss any necessary amendments of the Action Plan or confirm the current MOU Action Plan, as appropriate.

Recommended actions

1. The Meeting is recommended to:
2. review the current Action Plan regarding any needs for amendments;
3. discuss and endorse any potential amendments of the current MOU Action Plan, as appropriate.

**Annex**

**International Single-Species Action Plan for the Western Palaearctic Population of Great Bustard*, Otis tarda tarda***

***Revised version adapted for***

***the Memorandum of Understanding on the Conservation and Management of***

***the Middle-European Population of the Great Bustard***

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***The original Action Plan was prepared by:***

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**On behalf of the European Commission**

**A flag with yellow stars in a circle

Description automatically generated**

This revised version for the Middle-European Great Bustard MOU was updated and adopted

at the 5th Meeting of Signatories, September 2023

**International Single-Species Action Plan for the Western Palaearctic Population of Great Bustard*, Otis tarda tarda***

The present action plan was commissioned by the European Commission and prepared by BirdLife International as subcontractor to the “N2K Group” in the framework of Service Contract N#070307/2007/488316/SER/B2 “Technical and scientific support in relation to the implementation of the 92/43 ‘Habitats’ and 79/409 ‘Birds’ Directives”. The current version has been adapted to serve as the Action Plan for the CMS Memorandum of Understanding on the Conservation and Management of the Middle-European Population of the Great Bustard.

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**Milestones in the production of the plan**

2nd Meeting of the Signatories to the MOU on the Conservation and Management of the Middle European Population of the Great Bustard (*Otis tarda*):

11-12 November 2008

1st draft: 28 June 2009

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Final version: 31 March 2010

Adoption of MOU version: 11 April 2013

MOU version updated at 4th Meeting of the Signatories to the MOU on the Conservation and Management of the Middle European Population of the Great Bustard (*Otis tarda*) : March 2018

MOU version updated at 5th Meeting of the Signatories to the MOU on the Conservation and Management of the Middle European Population of the Great Bustard (*Otis tarda*) : September 2023

**Recommended citation**

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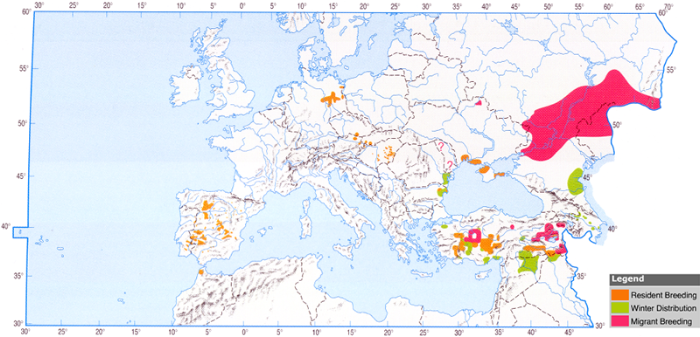
the Memorandum of Understanding on the Conservation and Management of

the Middle-European Population of the Great Bustard (*Otis tarda*).

**Photo credit:** M. Zumrik

**Geographical scope of the action plan**

The current distribution of the Great Bustard in the Western Palaearctic is presented below.

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**Figure 1. Distribution of the Great Bustard in the Western Palaearctic (Morales and Martin 2002).**

Table 1. The distribution of breeding, migratory and wintering populations in the Western Palearctic region. The Range States of the MOU are listed in bold – where the MOU Action plan should be implemented. For countries in brackets, there are no observations in the last 10 years.

|  |  |  |
| --- | --- | --- |
| **Breeding** | **Migration** | **Wintering** |
| ***Austria***  ***Czech Republic***  ***Germany***  ***Hungary***  *Kazakhstan[[1]](#footnote-2)*  *Morocco*  *Portugal*  ***(Republic of Moldova)***  ***Romania***  ***Russian Federation***  ***Serbia***  ***Slovakia***  *Spain*  *Turkey*  ***Ukraine***  *United Kingdom* | ***(Albania)***  *(Armenia)*  *Azerbaijan*  ***(Bosnia and Herzegovina)***  ***Croatia***  *(Georgia)*  ***Poland***  ***Russian Federation***  ***Serbia***  ***(Slovenia)***  ***(The FYR of Macedonia)*** | ***Austria***  *(Azerbaijan)*  ***(Bosnia and Herzegovina)***  ***(Bulgaria)***  ***Czech Republic***  ***Germany***  ***(Greece)***  ***Hungary***  ***(Italy)***  ***(Montenegro)***  *Morocco*  *Portugal*  ***Romania***  ***Russian Federation***  ***Serbia***  ***Slovakia***  *Spain*  *Turkey*  ***Ukraine***  *United Kingdom* |

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# 0 - EXECUTIVE SUMMARY

The Great Bustard is considered Vulnerable both in Europe and globally due to its large (>30%) decline over three generations (i.e. from the mid-1960s). The global population of the species is listed on Appendix I and Appendix II of CMS. A Memorandum of Understanding on the conservation and management of the Middle European population of the Great Bustard came into force on 1 June 2001. The species is also listed on Appendix II of CITES, on Appendix II of the Bern Convention and on Annex I of the EU Birds Directive. This action plan revises and updates the earlier European Action Plan (Kollar 1996) for the species which was endorsed by the Ornis Committee and by the Standing Committee of the Bern Convention and also formed the basis of the action plan initially adopted by the CMS Great Bustard MOU. It covers the Western Palaearctic populations of the species from Morocco to north-west Kazakhstan (up to the Ural River).

The Great Bustard is strongly attached to lowlands and undulating open countryside with dry soil and low level of annual rainfall. Great Bustard populations are migratory in the east and partially migratory elsewhere. With the advent of mechanized agriculture the species’ range severely contracted in the 19th and 20th centuries and the species has become extinct from many countries. Consequently, the Western Palaearctic range of the species is now highly fragmented. The latest estimate of the Great Bustard global population is 43,847–56,695 individuals (Alonso 2014). Approximately, 90 per cent of the global population occurs within the geographic scope of this action plan. Although the total European population of Great Bustard has not decreased over the last two decades and even increased as a result of concerted conservation efforts in Austria, Spain, Portugal, Germany and Hungary, current numbers are still far lower than three generations before (i.e. in the mid-1960s) and the contraction of the species’ range continues.

The main threats to the Great Bustard are the loss and degradation of its habitat through agricultural intensification, land-use changes and infrastructure development, increased mortality caused mainly by powerlines and reduced reproductive success due to high-levels of nest destruction by mechanized farming and high chick mortality through predation and starvation.

The **aim** of the plan is to recover the species from its current Vulnerable status in Europe to at least the population levels in 1979. **Objective** **1** of the plan is to achieve at least a 10 per cent increase in each biogeographic population within ten years. **Objective 2** of the plan is to improve the viability of existing isolated populations through restoring part of the species’ former range within 30 years. To this end the plan requires reducing the main mortality causes such as collision with powerlines and poaching. In addition, the action plan requires taking measures to reduce the negative impacts of modern agriculture on breeding success.

## 1 - BIOLOGICAL ASSESSMENT

### Taxonomy and biogeographic populations

Phylum: Chordata

Class: Aves

Order: Gruiformes

Family: Otididae

Genus: *Otis*

Species: *Otis tarda* (Linnaeus, 1758)

Polytypic species. The range of the nominate *tarda* Linnaeus, 1758 subspecies extends from Iberia, Morocco, Turkey, and Central and South-East Europe east to central Siberia in the upper basin of River Irtysh.

With the advent of mechanized agriculture, the species’ range severely contracted in the 19th and 20th centuries (see the section on Population size and trend below). Consequently, the Western Palaearctic range of the species is now highly fragmented and the following demographically independent biogeographic breeding populations can be distinguished (Faragó 1986):

* North African - Morocco
* Iberian - Spain, Portugal
* German-Polish Plain - Germany, Poland
* Carpathian Basin – Austria, Czech Republic, Hungary, Slovakia, Serbia, Romania and Bulgaria
* Eastern European – European Russia, Ukraine
* Middle-East – Turkey (extending into West of Iran)

Genetic studies indicate long-term historical separation between the populations from the Iberian Peninsula and the rest of mainland Europe (Pitra *et al.* 2000) and between Iberia and Morocco (Alonso *et al.* 2009a).

### Distribution throughout the annual cycle

Great Bustard populations are migratory in the east and partially migratory elsewhere. The Russian birds regularly migrate to the southern Ukraine and to the Caspian lowlands of Dagestan and Azerbaijan to winter. Some autumn movements can be observed also through Georgia, Armenia and Eastern Turkey also including Iran and Iraq. The central European Great Bustards are mainly resident. Unless there is a winter flight, they stay in the vicinity of their breeding grounds, rarely moving more than 15 to 25 km away. In harsh winters with high snow cover, they can be displaced (Faragó 1990a; Streich *et al.* 2006). In such situations, birds from Germany previously moved towards the North Sea countries such as the Netherlands, Belgium and France, while birds from the Carpathian Basin migrated towards Italy through Croatia and Slovenia, as well as to the Balkan (through Serbia, Montenegro, Albania, the FYR of Macedonia to Greece). However, such movements have not been recorded recently due to the currently small size of these populations and the improved availability of oilseed rape within their home range. On the other hand, telemetry studies proved that the Iberian populations also perform regular short distance movements (Alonso *et al.* 2009b; Alonso *et al.* 2001; Alonso *et al.* 2000; Morales et al. 2000; Palacin 2007; Palacin *et al.* 2009).

### Habitat requirements

The Great Bustard is strongly attached to lowlands and undulating open countryside with dry soil and low levels (< 600 mm) of annual rainfall. The species avoids steep or rocky terrains, deserts, wetlands and closed forests. Clear views of over 1 km on at least three directions appears essential. Under natural conditions, the species was probably confined to natural grasslands such as steppes and similar warm open habitats. However, it has adapted well to agricultural landscapes with high diversity of crops and low intensity of cultivation and disturbance (Morales and Martin 2002).

Usually, Great Bustard females select breeding habitats that provide sufficient cover, but also a good view of the surrounding area. Thus, most of the nests can be found in cereals, alfalfa, grasslands (e.g. *Molinia*, *Alopecurus*) and first year fallow land. However, replacement eggs can be also laid in maize, sunflower or potato fields. Females show high levels of fidelity to their natal sites and settle within a few kilometres to it (Alonso *et al.* 2000). Once established, nest areas are normally used every year.

Feeding habitat requirements during incubation are the same as breeding habitats because the female leaves the nest only for short periods. After hatching, the feeding area used by the families gradually increases. After harvest, families congregate on stubble fields. In autumn, flocks gradually aggregate at traditional wintering areas with oilseed rape or alfalfa (Faragó and Széll 1991) and traditional olive groves (Rocha 2006). In winter, the birds prefer winter wheat and rape, stubble of sunflower, cereals and soy (Andryushchenko, 2007)

### Survival and productivity

According to radio telemetry studies in Spain (Martin *et al.* 2007), approximately half of all marked birds died before reaching the age of 120 days, 13.1 per cent at age of 120–240 days, 2.4 per cent between age of 240–365 days and less than 30 per cent survived after their first year. Mortality decreased to 9.8 per cent in the second year and stabilized around this value. This corresponds well with Faragó’s (1991) results on captive reared chicks, who found that approximately half of the birds died in the first 30 days of their life and 72 per cent of all chick mortality within the first 100 days occurred in that period.

The age of first breeding is 2-4 years for females and 5-6 years for males (Morales and Martin 2002). The average clutch size was 1.93 eggs in 858 nests found in Hungary between 1974 and 1990 (Faragó 1992a), but 2.6 eggs in 19 nests in Portugal (Morgado and Moreira 2000). However, the average clutch size was smaller (2.12 eggs) in a larger sample of 86 nests in the latter country in 2002-2004 (Rocha 2006). In Central Europe[[2]](#footnote-3), the species regularly lays replacement eggs if the first clutch is lost. However, the reproductive value of replacement clutches is lower due to a higher proportion of infertile eggs and weaker chicks (Faragó 1983). However, data from Germany indicate that the fertility of eggs is only lower in eggs laid after the end of May (Langgemach and Litzbarski 2005).

Mean yearly population productivity was 0.14 chicks per female in an 11-year-long study in north-west Spain. Inter-annual variability in population productivity was high (0.04–0.29) and was positively correlated with precipitation in the previous winter (which is believed to influence food supply) and negatively correlated with the number of rainy days during the hatching period. Individual breeding success is higher in females older than six years (Morales *et al.* 2002). In another study, Martinez (2008) found that the mean productivity was 0.24 chicks per female in the large population in Castilla y León. However, Watzke (Watzke 2007) and Faragó (Faragó 2001a; Faragó 2001b) reported higher productivity from the Russian Federation and Hungary (0.25–0.43 and 0.41–0.48 chick per female respectively), but these figures refer to juveniles observed earlier in the chick rearing period than in Spain and this difference in census timing can explain, at least partly, this difference.

### Population size and trend

The latest estimate of the global population of the Great Bustard is 43,847–56,695 individuals (Alonso 2014). Approximately 90 per cent of the global population occurs within the geographic scope of this action plan. The populations within the EU Member States account for 65–70 per cent, of which Spain alone holds c*.* 60 per cent of the global population.

The Great Bustard populations in the Western Palaearctic started declining with the retreat of the fallow cultivation system across the Western Palaearctic. In the 19th century, the species became extinct from the UK (1832), Sweden (mid-19th century), France (1863) and Greece (end of 19th century). This process continued in the 20th century, with the Great Bustard’s extinction from the Syrian Arab Republic (1931), Azerbaijan (1940–50), Poland (1986) and the Republic of Moldova (2000) and it can be considered as quasi extinct, with occasional breeding records, from the Czech Republic, Slovakia, Bulgaria and Romania as a breeding species. The populations in Spain, Portugal, Germany, Austria, Slovakia, Hungary, Serbia, Morocco, Ukraine, the Russian Federation and Turkey have also suffered large declines during the 20th century. In Spain, Portugal, Germany, Hungary, Austria and the Russian Federation, the declining population trend has changed to positive or stable from the 1990s as a consequence of a combination of species conservation measures and extensification of farming at least within some areas. However, the contraction and fragmentation of the range has continued in most countries (Alonso *et al.* 2004; Alonso *et al.* 2003; Faragó 1993; Pinto *et al.* 2005; Palacín & Alonso, 2009).

Table 2. Population size and trend by country of the Great Bustard

| **Country** | **Breeding numbers[[3]](#footnote-4)** | **Quality** | **Year(s) of the estimate[[4]](#footnote-5)** | **Breeding Population trend in the last 3 generations[[5]](#footnote-6)** | **Quality** | **Maximum size of migrating or non-breeding populations in the last 10 years[[6]](#footnote-7)** | | **Quality** | **Year(s) of the estimate[[7]](#footnote-8)** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Albania*** | n.a. | n.a. | n.a. | n.a. | n.a. | Few inds. | | Poor | 2002/2003 | |
| *Armenia* | n.a. | n.a. | n.a. | n.a. | n.a. | Few inds. | | Poor | Unknown | |
| ***Austria*** | 368–481 | Good | 2017 | Moderate increase | Good | N/A | | Good | 2017 | |
| *Azerbaijan* | n.a. | n.a. | n.a. | n.a. | n.a. | 10-100s | | Poor | Unknown | |
| ***Bosnia-Herzegovina*** | n.a. | n.a. | n.a. | n.a. | n.a. | No record in the last 10 years | | | | |
| ***Bulgaria*** | 0-6 | Poor | 2007 | Large decline | Poor | Few inds. | | Medium | 2008 | |
| ***Czech Republic*** | 1-6 | Good | 2014-2017 | Large decline | Medium | Few inds. | | Medium | 2008 | |
| ***Croatia*** | n.a. | n.a. | n.a. | n.a. | n.a. | No record in the last 10 years | | | | |
| *Georgia* | n.a. | n.a. | n.a. | n.a. | n.a. | Few inds. | | Poor | Unknown | |
| ***Germany*** | 238 | Good | 2017 | Moderate increase | Good | N/A | | | | |
| ***Greece*** | n.a. | n.a. | n.a. | n.a. | n.a. | Few inds. | | Poor | Unknown | |
| ***Hungary*** | 1,596 | Good | 2017 | Moderate increase | Good | N/A | | | | |
| ***Italy*** | n.a. | n.a. | n.a. | n.a. | n.a. | No record in the last 10 years | | | | |
| *Kazakhstan* | 0-506 | Good | 2014 | Large decline | Medium | Unknown | | | | |
| ***Montenegro*** | n.a | n.a | n.a | n.a | n.a | n.a | | | | |
| *Morocco* | 45-506 | Good | 2016 | Large decline | Medium | Min. 82 | Medium | | | 2001/2002 |
| ***Poland*** | Extinct | Good | 1986 | N/A | Good | No record in the last 10 years | | | | |
| *Portugal* | 1,8936 | Good | 2014 | Large decline | Medium | Similar to breeding numbers | | | | |
| ***Republic of Moldova*** | Extinct | Poor | 2001 | Large decline | Medium | No record in the last 10 years | | | | |
| ***Romania*** | 0–5 | Poor | 2017 | Large decline | Medium | ≈33 | | Medium | 2013-2017 | |
| ***Russian Federation*** *(European part)* | 2,500–3,000 | Medium | 2013-2015 | Large decline | Medium | Unknown | | | | |
| ***Serbia*** | 10-14 | Good | 2017 | Slow decline | Medium | Similar to breeding numbers | | | | |
| ***Slovakia*** | 0–3 | Good | 2017 | Large decline | Good | 98 | | Good | 2017 | |
| ***Slovenia*** | n.a. | n.a. | n.a. | n.a. | n.a. | No record in the last 10 years | | | | |
| *Spain* | 29,400-34,3006 | Good | 2014 | Stable | Good | Similar to breeding numbers | | | | |
| ***The FYR of Macedonia*** | n.a. | n.a. | n.a. | n.a. | n.a. | No record in the last 10 years | | | | |
| *Turkey* | 700-11806 | Good | 2016 | Large decline | Medium | Unknown | | | | |
| ***Ukraine*** | 450-500 | Poor | 2013 | Large decline | Poor | 3000-4000\* | | Moderate | 2013 | |
| *United Kingdom* | 45 † | Good | 2017 | Increase ‡ | Good | N/A | | | | |
| **Totals** | **37,271-43,392** |  |  |  |  |  | |  |  | |

## 

## Notes on Table 2:

## 6 Numbers and years were taken from BirdLife Datazone (BirdLife International 2017).

## *\** Population declined by 70-80% over the last 10 years in traditional wintering areas.

## † This figure is an estimate from December 2017 based on data from the current reintroduction project in the UK. It has not been published in peer-reviewed scientific literature nor been confirmed by Government authorities.

‡ The population has been supplemented with eggs and chicks from the Russian and Spanish populations since the beginning of the reintroduction project in 2004. The demographic rates of survival probability, recruitment of juveniles and productivity measured over the period 2004-2014 have been reported as being insufficient for a long-term viability and a self-sustaining population (Ashbrook *et al.* 2016). In recent periods (since 2016), higher survival rates have been reported, while release of birds from Spain has continued (Manvell and Goriup 2017).

## 2 - THREATS

### General overview

The main threats to the Great Bustard are the loss and degradation of its habitat through agricultural intensification, land-use changes and infrastructure development, increased mortality caused mainly by powerlines and reduced reproductive success due to high-levels of nest destruction by mechanized farming and high chick mortality through predation and starvation.

### List of critical and important threats

*Loss of undisturbed open habitats with suitable vegetation structure*

The Great Bustard is closely associated with flat or gently undulating, open habitats with little disturbance. Changes in crop pattern (i.e. ploughing up grasslands, shifting from cereals to sunflower and maize) or in grazing pressure, which was encouraged by the specialization of agriculture, price changes and policies, have created unsuitable conditions in several parts of the range. Often crop changes are associated with the introduction of irrigation, which allows the replacement of drought-resistant cereals by maize. Afforestation had a negative impact on several populations (e.g. Sterbetz 2000). In the European Union and in many other countries, afforestation has been subsidized to reduce desertification and to reduce agricultural surpluses. Expansion of settlements, industrial areas, transport infrastructure (Osborne *et al.* 2001; Palacín 2007) and, most recently, the installation of wind farms (Raab *et al.* 2012) have all reduced habitat availability. Although these changes individually may affect only a smaller or larger proportion of the species’ habitat and hence represent only local to medium threat, their cumulative effect can be considered as a major threat to the species.

***Impact: Critical***

*Collision with powerline**s*

Great Bustard is particularly vulnerable to collision with powerlines because of its congregations at feeding areas in winter and at display grounds in spring (Janss and Ferrer 2000; Raab *et al.* 2009; Reiter 2000). Collisions were also reported for post-breeding period in Portugal where 16 birds collided with a powerline during one year (Marques et al. 2005) and also for the wintering period in Ukraine where 11 birds (Andryushchenko et al., 2002) and 6 birds (Andryushchenko et al., 2014) collided with a powerline during two years. Although reported from the entire range, the impact of collision on the population is difficult to assess. Martin et al. (Martin *et al.* 2007) reported that collision with powerlines was responsible for 55 per cent of deaths during the second year of life of subadult Great Bustards and it appears to be the main cause of mortality for adult birds as well. The importance of this threat is assessed as high for the entire population, but it can be critical for some local and isolated populations (e.g. Austria).

***Impact: High***

*Destruction of eggs or chicks during agricultural works*

In a modern farming landscape, Great Bustard nests are destroyed during various agricultural works, such as ploughing up fallow land, mowing of alfalfa or grass and, to a lesser extent, application of pesticides or mechanical cultivation of crops or harvesting of cereals. The species is particularly affected by farming operations because it prefers the crops (i.e. alfalfa and cereals) where its nest is most likely to be destroyed (i.e. these crops act as ‘ecological traps’). According to questionnaire surveys in the 1990s and monitoring activities carried out in the framework of the OTISHU LIFE project, 30-35 per cent of the nests were destroyed by agricultural works in Hungary (Faragó 2001b; Kalmár and Faragó 2008). In Portugal, 15 per cent of 74 nests studied were destroyed by agricultural activities (Rocha 2006).

***Impact: High***

*Predation of eggs, chicks or juveniles*

Predation of eggs by mammalian predators and birds, such as Corvids and birds of prey (e.g. Marsh harrier) has been reported from several Range States (Faragó *et al.* 2001; Langgemach 2005; Martin *et al.* 2007, Hungarian data unpublished). In Central Europe, Red Fox populations have increased substantially following the extensification of agriculture and the start of immunization against rabies. In Hungary, the intensive growth of Wild Boar populations poses an increasing threat by destroying nests, and predating on eggs or even smaller chicks – being present at almost all Great Bustard habitats in the country. The role of Jackals and non-native species, such as racoon and racoon-dog is still unclear.

***Impact: High***

*Disturbance*

Frequent disturbance can disrupt feeding, mating and nesting activities which may decrease breeding success or might increase the probability of collision with power lines or of predation. Experience shows, that disturbance during the display of birds can cause the increase in the number of infertile eggs, which leads ultimately to the decrease in breeding success. Disturbance due to agricultural activities during the breeding season, even if nest destruction does not occur, can be particularly harmful and can lead to the abandonment of the nest. Even temporary abandonment during brooding exposes the clutch and often leads to predation. Repeated disturbance by hunting in winter on or nearby Great Bustard wintering grounds, might cause the adverse weakening of birds – through the repeated flushing of the birds. A study by Sastre et al. (2009) in central Spain showed that car traffic and walkers were the main sources of disturbance, although motorcyclists, dogs, helicopters and aeroplanes were also harmful in relation to their abundance and time of presence. Farming and shepherding produced little disturbance and did not usually cause a flight response. Hunting caused an increase in the frequency of disturbance on weekends and holidays with respect to working days. It is believed that due to ban of the Great Bustard hunting in Ukraine the facts of their illegal shooting are concealed.

***Impact: Medium***

*Insufficient invertebrate food supply*

The productivity of the Great Bustard can be influenced by chick mortality caused by starvation if invertebrate food supply is limited (Martin *et al.* 2007; Morales *et al.* 2002). Food supply is influenced by the development of vegetation, winter precipitation (Litzbarski and Litzbarski 1996) and by pesticide use (Faragó 1990b; Hellmich 1992; Litzbarski *et al.* 1989; Quaisser *et al.* 1998; Sprick 1999).

***Impact: High***

*Climate change*

Climate envelop models (Huntley *et al.* 2007; Osborne *et al.* 2008) suggest that the total climatically suitable area will decrease by some 20 per cent between 2010 and 2020. According to the models’ projections, the loss of climatically suitable habitat ranges between 45 per cent (Turkey) and 100 per cent (Kazakhstan). In this context, the future of the Hungarian and the Russian populations are of the greatest concern considering their size. There are known cases of mortality (or catching by humans) of individuals which lost their ability to fly because of plumage icing. This is not frequent but regular cases when rainy weather sharply changed into strong frost. The feathers became iced not being able to dry because of lack of time

***Impact: Low***



Figure 2. Number of decades over which areas are predicted to be climatically suitable for Great Bustards (Osborne *et al.* 2008)

*Poaching*

The Great Bustard was considered a game species in most countries within its range and many authors consider that poaching was a *critical* factor in the decline of the population at the level of taking at that time, when accounting for the sensitivity of the population to small increases in adult mortality. Therefore, hunting has now been officially banned in all Range States. In most countries, introduction of a hunting ban has been followed by temporary (e.g. Hungary) or sustained population growth (e.g. Spain) depending on the impact of other factors influencing the population (Palacin and Alonso 2008; Sterbetz 1978). Despite the legal ban, poaching still occurs to some extent mostly when migrating / wintering. In some countries, such as the Russian Federation and Ukraine, even organized forms advertised through the Internet occur. The importance of this threat is assessed as low for the entire population, but possible *medium* in the above-mentioned countries.

***Impact: Low***

*Catastrophic mortality in harsh winters*

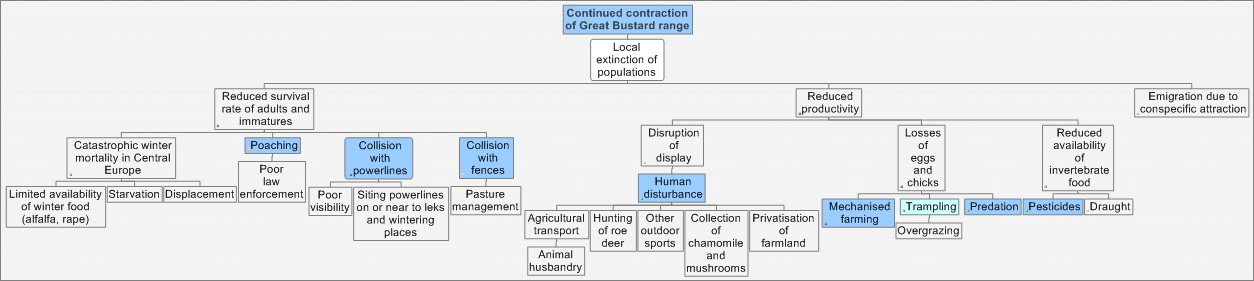
In exceptionally harsh winters when a thick blanket of snow prevents access to food, forcing the population to disperse out of its normal wintering area, catastrophic mortality exceeding 15 per cent can occur (Faragó 1990a; Streich *et al.* 2006) as a result of starvation, collision with powerlines and poaching. In such cases the birds are often observed near the haystacks, roads and settlements and vulnerable to hunters, wolves and stray dogs. Although this would normally cause only longer-term fluctuations in population numbers, it can accelerate the decline of the population when the reproductive rate is limited.

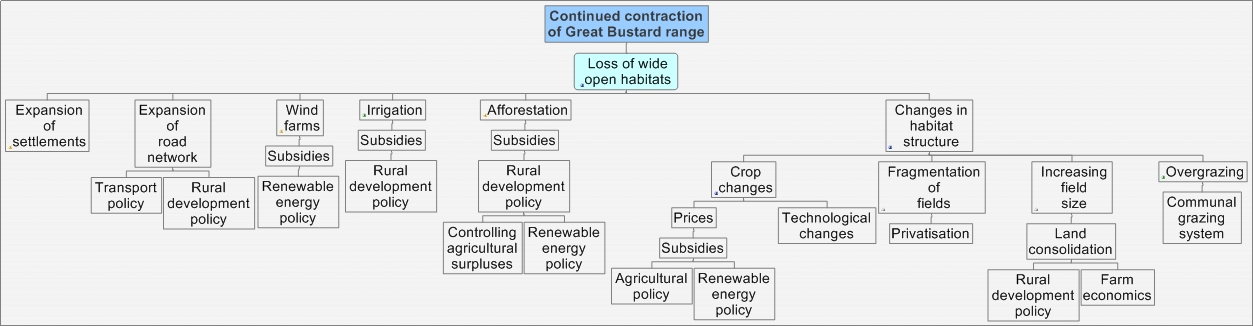
***Impact: Low***

### Population Viability Analysis (PVA)

Over the last decades, several PVAs have been prepared for the Great Bustard covering the Iberian (Alonso *et al.* 2004; Lane and Alonso 2001; Pinto *et al.* 2005), the German (Streich *et al.* 1996; Streich 2000), the Hungarian (Faragó 1992b) and the Saratov, Russian (Streich 2007) populations of the Great Bustard. All PVAs agree that the extinction risk of a Great Bustard population is most sensitive to the survival of females and to productivity. However, relatively small changes in survival rates can be compensated only by relatively high increases in productivity. Modelling also suggests that increases in productivity through agri-environmental measures is sensitive to the proportion of the range covered by the scheme and to having it targeted to crops particularly attractive to the species but at high risk of being cultivated during the breeding season - such as alfalfa and grass (Nagy 2008). PVAs for the Hungarian population (Faragó 1992b) have highlighted the conservation implications of periodic catastrophic winter mortality which can occur in harsh winters. Conspecific attraction may also contribute to an accelerated decline of marginal populations and further increase of populations in high quality habitat (Alonso *et al.* 2004; Pinto *et al.* 2005).

Figure 3. Problem tree[[8]](#footnote-9)





## 3 - POLICIES AND LEGISLATION RELEVANT FOR MANAGEMENT.

### International conservation and legal status of the species

The Great Bustard is considered globally Vulnerable (A2c, A3c, A4c) based on both past and on suspected future decline of the range (BirdLife International 2018). In Europe, the species is classified as Vulnerable (A2b) by BirdLife International (BirdLife 2018) considering its large (>30%) decline.

The global population is listed on Appendix I of CMS and remains listed on Appendix II. A Memorandum of Understanding on the conservation and management of the Middle European population of Great Bustard came into force on 1 June 2001. The species is also listed on Appendix II of CITES, on Appendix II of the Bern Convention and on Annex I of the Birds Directive.

A European Action Plan was produced under the auspices of the European Commission and the Bern Convention and another edition of the same plan under the CMS Great Bustard MOU (CMS 2000; Kollar 1996).

### National policies, legislation and ongoing activities

The species is legally protected across its European range, being either as a protected species (Austria, Albania, Bulgaria, Czech Republic, Hungary, Germany, Romania, Slovakia, Spain, Portugal, the Russia Federation, Ukraine and Turkey) and/or as a game bird with a year-round closed season (Austria, Germany, Slovakia and the Former Yugoslav Republic of Macedonia). However, poaching still continues in several countries (e.g. Ukraine, the Russian Federation and Turkey).

Most of the internationally important sites are designated as Special Protection Areas under the Birds Directive within the European Union Member States. However, the designation of several sites still remains incomplete. Outside of the European Union, designation of key sites as protected is still insufficient. In Ukraine, Turkey and the Russian Federation, only a small proportion of the population is within protected areas.

### Ongoing activities for conservation of the species

Over previous years, the species’ requirements have been increasingly incorporated into the Rural Development Plans within the EU Member States. Agri-environmental schemes support habitat management measures in Austria, Germany, Hungary, Slovakia, Portugal and Spain. In Germany, farmers are also supported under extensification schemes. However, the potential negative impact of abolishing the set-aside obligation under the Common Agricultural Policy was reported from Austria and Germany.

In 2007, Hungary introduced legislation on Natura 2000 payments to compensate for restrictions on grassland management within these areas. However, it is not sufficient relating to Great Bustard conservation. Similar payments are also available in Germany. However, problems have been reported concerning scheme prescriptions, coverage, payment levels and conflicts with other schemes (Nagy and Crockford 2004; Nagy *et al.* 2008; Onate *et al.* 1998). Outside of the European Union, targeted habitat conservation measures are carried out mostly as part of NGO initiatives, covering only a small proportion of the range and are not integrated into national agricultural policy (BirdLife International 2008b).

Habitat fragmentation has not been effectively addressed in most Range States, although the increased coverage of SPAs provides some safeguard within these areas. Some measures have been taken as part of LIFE or other projects in Germany, Hungary, Spain, Portugal and Ukraine to address the problem of collision with powerlines.

Nest safeguarding or rescue and captive management measures were applied only in Germany, Hungary and the Russian Federation. Germany and Hungary have made good progress in repatriating captive reared birds. Captive-reared birds from Saratov, Russian Federation, and from Spain have been used in the trial reintroduction scheme in the United Kingdom since 2003, which resulted in successful breeding of the species in 2009 after more than 175 years.

## 4 - FRAMEWORK FOR ACTION

### Aim

To recover the species from its Vulnerable status in each demographically independent biogeographical region to at least the breeding population levels in 1979.

### Objectives

Objective 1: Within 10 years, each biogeographic population increased by at least 10 per cent.

Objective 2: Within 30 years, part of the species’ former range restored to improve the viability of existing isolated populations.

### Results

Result 1.1 Average annual adult survival rate is above 90 per cent in each population

Result 1.2 Average productivity exceeds 0.25 chicks per female in each population

Result 1.3 Extent of suitable habitat maintained across the range of the species

Result 1.4 Knowledge gaps filled

Result 2.1 Effective habitat management and repatriation methods available to assist restoration of Great Bustard populations

Result 2.2 Raising public awareness

### Actions

Table 3 includes all the results and actions necessary to achieve the objectives of the plan.

**Table 3. Actions****corresponding to the expected results and ranked according to their importance, following from the problem tree.**

| ***Expected Result*** | ***Action*** | ***Priority*** | ***Organisations responsible*** |
| --- | --- | --- | --- |
| ***1.1 Average annual adult survival rate is above 90% in each population*** | * + 1. Reduce collision with powerlines through avoiding key areas for Great Bustard, through marking and, if necessary, even removal of existing dangerous sections of powerlines **Applicable to: all Range States** | High | Competent national authorities, electricity companies |
| * + 1. Prevent the occurrence of catastrophic winter mortality events through supporting the production of oilseed rape and alfalfa at suitable undisturbed locations far from existing powerlines within the traditional wintering areas and establish capacity to clear snow from fields in emergency situations **Applicable to: all Range States** | High | Competent conservation and agricultural authorities, site managers |
| * + 1. Maintain hunting ban in all Range States and step up efforts to stop poaching where it still occurs, taking into account guidelines on predator control, connect to IKB work and platform and guidance under CMS **Applicable to: all Range States** | High | Competent conservation and game management authorities |
| * + 1. Prevent collision with wind turbines in key sites and flyways for Great Bustard   Include tagging data to inform precise results  Connect actions to the Energy Task Force and existing guidance | Low | Competent conservation and game management authorities |
| ***1.2 Average productivity exceeds 0.25 fledged chicks per adult female in each population as of start of October*** | * + 1. Identify and apply adequate compulsory restrictions on breeding sites on agricultural practices that significantly reduce the breeding success of the species, such as mowing of alfalfa or grass according to the local breeding phenology of the species, and provide compensation to farmers   Implement guidelines on agri-environmental schemes **Applicable to: all breeding Range States** | High | Competent conservation and agricultural authorities |
| * + 1. Apply complementary nest safeguarding, egg rescue and measures where necessary and appropriate **Applicable to: all breeding Range States** | Low | Competent conservation authorities, NGOs |
| * + 1. Restrict/Control grazing on key breeding areas where trampling significantly reduces the breeding success **Applicable to: all breeding Range States** | Medium | Competent conservation and agricultural authorities |
| 1.2.4 Support extensification of agricultural practices in areas inhabited by Great Bustards, including the promotion of set-aside schemes and organic farming. The timing of all measures should be adapted to the life cycle of the Great Bustard. **Applicable to: all breeding Range States, but Austria, Germany, Hungary, Slovakia, Czech Republic, Serbia, Romania and the Russian Federation in particular** | High | Competent conservation and agricultural authorities |
| 1.2.5 Monitor impact of predators on breeding success and apply predator control measures if necessary **Applicable to: all breeding Range States** | High | Competent conservation and game management authorities |
| 1.2.6 Create enclosures in the breeding areas of populations if the main reason of breeding failure is predation **Applicable to: all breeding Range States** | Medium | Competent conservation authorities, site managers |
| 1.2.7 Reduce human disturbance by restricting access to display and breeding grounds as necessary **Applicable to: all breeding Range States** | Medium | Competent conservation authorities, site managers |
| ***1.3 Extent of suitable habitat maintained across the range of the species*** | 1.3.1 Designate all sites holding populations of Great Bustards listed in Annex 2 of this Action plan as Special Protection Areas in the EU Member States or under national legislation in non-EU countries **Applicable to: all Range States** | High | Competent conservation authorities |
| 1.3.2 Introduce, or continue where they already exist, agri-environmental schemes or similar incentive measures to promote farming techniques compatible with the species’ requirements and monitor the effectiveness of such measures **Applicable to: all Range States** | High | Competent conservation and agricultural authorities |
| 1.3.3 Ensure that power lines, afforestation, irrigation, wind turbines, wind breaks, solar power panels, transport (roads, railway) and other projects including enlargement of cities, settlements, orchards, vinyards and related agricultural changes which can negatively affect the Great Bustard’s habitat do not take place  **Applicable to: all Range States** | High | Competent conservation and agricultural authorities |
| ***1.4. Knowledge gaps filled*** | 1.4.1 Identify all areas for Great Bustard across its European range **Applicable to: the Russian Federation, Ukraine** | High | Competent conservation authorities, research institutes, NGOs |
| 1.4.2 Monitor the size, sex and age composition, threats and productivity of each population listed in Annex 2 of this Action plan, based on standardized counts in winter, spring and autumn **Applicable to: all breeding Range States with regular populations** | High | Competent conservation authorities, research institutes, NGOs |
| 1.4.3 Monitor and improve the effectiveness of all conservation measures, including, where relevant, captive breeding, and rearing and release programmes. **Applicable to:** **all Range States** | Low | Competent conservation authorities, research institutes, NGOs |
| 1.4.4 Carry out comparative ecological studies on the population dynamics and the genetic structure of populations, on habitat requirements and on the effects of habitat changes and infrastructure on the populations **Applicable to: all Range States with regular populations** | Medium | Competent conservation authorities, research institutes, NGOs |
| 1.4.5 Expand studies to improve the understanding of survival and mortality factors. Promote telemetry studies thereof if relevant. **Applicable to: all Range States** | High | Competent conservation authorities, research institutes, NGOs |
| 1.4.6 Investigate the factors influencing breeding success and survival, and study key parameters, such as habitat availability and choice, home range and dispersal patterns;  dedicate attention to the insect biomass as necessary food supply in the breeding area **Applicable to: all breeding Range States** | High | Competent conservation authorities, research institutes, NGOs |
| 1.4.7 Analyse regular and irregular migratory movements, and seasonal movements of birds, promote telemetry and other marking methods thereof to better understand the meta-population structure. **Applicable to: all Range States** | Medium | Competent conservation authorities, research institutes, NGOs |
| 1.4.8 Study the impact of climatic changes on the productivity and survival of the Great Bustard and on its habitat. If necessary, develop habitat management techniques for mitigating the impacts of climate change **Applicable to: Hungary, Poland, the Russian Federation, Ukraine** | Low | Competent conservation authorities, research institutes, NGOs |
| 1.4.9 Investigate diseases as a risk factor for the Great Bustard. Consider infectious, metabolic and other diseases and the possibility of a spill-over from other species | Medium | Research institutes, site managers |
| ***2.1 Effective habitat management and repatriation methods available to assist restoration of Great Bustard populations*** | 2.1.1 Improve habitat for Great Bustard in formally occupied sites, where feasible | Medium | Competent conservation authorities, research institutes, NGOs |
| 2.1.2 Develop feasibility studies and management plans to restore transboundary populations and expanding the habitats in these regions **Applicable to: Bulgaria, Poland, Romania, Hungary, Serbia, Slovakia** | Low | Research institutes |
| 2.1.3 Promote Reintroduction projects on the basis of adequate research and feasibility studies and the respective IUCN Guidelines for Reintroductions and Other Conservation Translocations  **Applicable to: all Range States** | Low | Competent conservation authorities, research institutes, NGOs |
|  | 2.1.4 Harmonize national restoration plans for the Great Bustard under the EU Nature Restoration Law  **Applicable to: all MOU Range States in the EU and Spain and Portugal** | High | Competent conservation authorities, research institutes, NGOs |
| ***2.2  Raising public awareness*** | 2.2.1 Promote eco-tourism and bird watching in Great Bustard areas, under the appropriate regulatory framework to improve economic viability of Great Bustard areas. **Applicable to: all Range States** | Low | Competent conservation and rural development authorities, NGOs |
| 2.2.2 Promote Great Bustard conservation among stakeholders (e.g. authorities, land owners, farmers and hunters)  **Applicable to: all Range States** | High | Competent conservation and rural development authorities, NGOs |
| 2.2.3 Use the Great Bustard as flagship species through education in raising the profile of nature conservation  **Applicable to: all Range States** | High | Competent conservation and rural development authorities, NGOs |

## 5 - REFERENCES

Alonso, J. C. (2014). The Great Bustard: past, present and future of a globally threatened species. – *Ornis Hungarica* **22**(2): 1-13

Alonso, J., Martín, C., Alonso, J., Palacín, C., Magaña, M., Lieckfeldt, D. and Pitra, C. (2009a). Genetic diversity of the great bustard in Iberia and Morocco: risks from current population fragmentation. *Conservation Genetics* **10**(2): 379-390.

Alonso, J., Palacín, C., Alonso, J. and Martín, C. (2009b). Post-breeding migration in male great bustards: low tolerance of the heaviest Palaearctic bird to summer heat. *Behavioral Ecology and Sociobiology* **63**(12): 1705-1715.

Alonso, J. A., Martín, C. A., Alonso, J. C., Morales, M. B. and Lane, S. J. (2001). Seasonal movements of male Great Bustards in Central Spain. *J. Field Ornithol.* **72**(4): 504-508.

Alonso, J. C., Martín, C. A., Alonso, J. A., Palacín, C., Magana, M. and Lane, S. J. (2004). Distribution dynamics of a great bustard metapopulation throughout a decade: influence of conspecific attraction and recruitment. *Biodiversity and Conservation* **13**: 1659-1674.

Alonso, J. C., Martin, C. A., Palacin, C., Magana, M. and Martin, B. (2003). Distribution, size and recent trends of the great bustard Otis tarda population in Madrid region, Spain. *Ardeola* **50**(1): 21-29.

Alonso, J. C., Morales, M. B. and Alonso, J. A. (2000). Partial migration, and lek and nesting area fidelity in female Great Bustards. *The Condor* **102**(1): 127-136.

Andryushchenko Yu., Beskaravainy M., Stadnichenko I. (2002). Demise of bustards and other birds species because of their collision with power lines on the wintering grounds. Branta 5: 97-112 (in Russian).

Andryushchenko Yu. (2007). The Great Bustard in southern Ukraine. *Bustards studies* **6**: 111-129.

Andryushchenko Yu., Kucherenko V., Popenko V. (2014). Monitoring results of deaths of wild birds from contacts with overhead power lines in the Crimea in 2012-2014. Branta 17: 104-132 (in Russian).

Ashbrook, K., Taylor, A., Jane, L., Carter, I. and Székely, T. (2016) Impacts of survival and reproductive success on the long-term population viability of reintroduced Great Bustards *Otis tarda* in the UK. *Oryx*, **50** (4): 583-592.

BirdLife International (2004). *Birds in Europe: Population estimates, trends and conservation status*. Cambridge, U.K., BirdLife International.

BirdLife International (2008a). Revised Format for the AEWA International Single Species Action Plan. *4.36*. Bonn, AEWA Secretariat**:** 29.

BirdLife International (2008b). *Revised overview report*. Second Meeting of the Signatories to the Middle-European population of Great Bustard (Otis tarda), Fedosia, Ukraine, CMS.

BirdLife International (2017): Datazone, http://datazone.birdlife.org/species/factsheet/great-bustard-otis-tarda

CMS (2000). Action Plan for the Memorandum of Understanding on the Conservation and Management of the Middle-European Population of the Great Bustard (*Otis tarda*). CMS. Bonn**:** 6 + annexes.

Faragó, S. (1983). A túzok (Otis t. tarda L.) fészkelésbiológiája Magyarországon. *Állattani Közlemények* **70**: 33-38.

Faragó, S. (1986). Suggestion for keeping register book-like records of European Great Bustard (*Otis tarda tarda*, Linne 1758) populations *5th ICBP Bustard Symposium*. Szarvas, Hungary.

Faragó, S. (1990a). A kemény telek hatása Magyarország túzok (Otis tarda L.) állományára. *Állattani Közlemények* **76**: 51-62.

Faragó, S. (1990b). Vizsgálatok a szárnyasvad állati eredetű táplálékbázisáról mezőgazdasági környezetben Magyarországon. I. A szárnyasvad tápláléka, a táplálékbázis-vizsgálatok anyaga és módszere. *Erdészeti és Faipari Tudományos Közlemények* **1989**(2): 153-191.

Faragó, S. (1991). *Az idő-tényező szerepe a túzokcsibék (*Otis tarda*) kelésében és felnevelésében*. A Magyar Madártani és Természetvédelmi Egyesület III. Tudományos Ülése, Szombathely, MME.

Faragó, S. (1992a). Clutch size of the Great Bustard (*Otis tarda)* in Hungary. *Aquila* **99**: 69-84.

Faragó, S. (1992b). *A túzok (Otis tarda L.) -állomány fenntartásának ökológiai alapjai Magyarországon*. Sopron, Erdészeti és Faipari Egyetem, Vadgazdálkodási Tanszék.

Faragó, S. (1993). Development of great bustard populations in Hungary in the period 1981-1990. *Folia Zoologica* **42**(3): 221-236.

Faragó, S. (2001a). Great Bustard Census in Hungary 1988. *Magyar Apróvad Közlemények* **6**: 277-300.

Faragó, S. (2001b). Magyarország túzokállománya az 1985. évi országos túzokállományfelmérés alapján. *Magyar Apróvad Közlemények* **6**(239-276): 239-276.

Faragó, S., Giczi, F. and Wurm, H. (2001). Management for the great bustard (Otis tarda) in western Hungary. *Game and Wildlife Science* **18**(2): 171-181.

Faragó, S. and Széll, A. (1991). *Choice of habitat and flock formation of Great Bustard in Hungary*.

Hellmich, J. J. (1992). Impacto del uso de pesticidas sobre las aves: el caso de la Avutarda (Otis tarda L.). *Ardeola* **39**(2): 7-22.

Huntley, B., Green, R. E., Collingham, Y. C. and Willis, S. G. (2007). *A climatic atlas of European breeding birds*. Barcelona, Durham University, the RSPB and Lynx Edicions.

IUCN S.S.C. (2001). *IUCN Red List Categories*. Gland, Switzerland & Cambridge, UK, IUCN.

Janss, G. F. E. and Ferrer, M. (2000). Common crane and great bustard collision with power lines: collision rate and risk exposure. *Wildlife Society Bulletin* **28**(3): 675-680.

Kalmár, S. and Faragó, S. (2008). A túzok védelme Magyarországon LIFE-Nature projekt 2007-2008. évi monitoring jelentése. *Magyar Apróvad Közlemények*. Faragó, S. Sopron, Nyugat-Magyarországi Egyetem, Vadgazdálkodási és Gerinces Állattani Intézet**:** 282.

Kollar, H. P. (1996). Action plan for the Great Bustard (*Otis tarda*) in Europe. *Globally threatened birds in Europe: action plans*. Heredia, B., Rose, L. and Painter, M. Strasbourg, Council of Europe**:** 245-260.

Lane, S. J. and Alonso, J. C. (2001). Status and extinction probabilities of great bustard (Otis tarda) leks in Andalucia, southern Spain. *Biodiversity and Conservation* **10**(6): 893-910.

Langgemach, T. (2005). Predation management to improve reproductive success of the Great Bustard (*Otis tarda*) in Germany. *Aquila* **112**: 151-152.

Langgemach, T. and Litzbarski, H. (2005). Results of artificial breeding in the German great bustard (Otis tarda) conservation project. *Aquila* **112**: 191-202.

Litzbarski, B. and Litzbarski, H. (1996). Einfluß von Habitatstruktur und Entomofauna auf die Kükenaufzucht bei der Großtrappe. *Naturschutz und Landschaftspflege in Brandenburg* **5**(1/2): 59-64.

Litzbarski, B., Litzbarski, H. and Jaschke, W. (1989). Habitatstruktur und Nahrungsangebot für ausgewählte Vogelarten unter den Bedingungen intensiver landwirtschaftlicher Produktion. Einfluß von Agrochemikalien auf die Populationsdynamik von Vogelarten in der Kulturlandschaft. *Festsymposium Seebach 1988*.

Manvell, R. and Goriup, P. (2017) The Great Bustard re-introduction trial: a response to Ashbrook et al. *Oryx*, **51**(3): 402

Marques, T., Rocha, P. & J. P. Silva (2005). Monitorização dos Efeitos da Linha de Muito Alta Tensão Ferreira-do-Alentejo / Ourique sobre Espécies Prioritárias, Mortalidade e Taxas de Voo. Relatório Final. Instituto de Conservação da Natureza/Rede Eléctrica Nacional.

Martin, C. A., Alonso, J. C., Alonso, J. A., Palacin, C., Magana, M. and Martin, B. (2007). Sex-biased juvenile survival in a bird with extreme size dimorphism, the great bustard Otis tarda. *Journal of Avian Biology* **38**(3): 335-346.

Martínez, C. (2008). Distribution, density and productivity of great bustards Otis tarda in northwestern Spain: a regional approach. *Journal of Ornithology* **149**(4): 507-514.

Morales, M. B., Alonso, J. C. and Alonso, J. (2002). Annual productivity and individual female reproductive success in a great bustard Otis tarda population. *Ibis* **144**(2): 293-300.

Morales, M. B. and Martin, C. A. (2002). Great Bustard *Otis tarda*. *BWP Update* **4**(3): 217-232.

Morgado, R. and Moreira, F. (2000). Seasonal population dynamics, nest site selection, sex-ratio and clutch size of the Great Bustard *Otis tarda* in two adjacent lekking areas. *Ardeola* **47**(2): 237-246.

Nagy, S. and Crockford, N. (2004). Implementation in the European Union of species action plans for 23 of Europe’s most threatened birds. *Report to the European Commission*. Wageningen**:** 124.

Nagy, S., Széll, A. and Motkó, B. (2008). Hatásosak-e a túzok (Otis tarda) védelmét szolgáló magyar agrár-környezetvédelmi intézkedések? *Aquila* **114/115**: 47-55.

Onate, J. J., Malo, J. E., Suárez, F. and Peco, B. (1998). Regional and environmental aspects in the implementation of Spanish agri-environmental schemes. *Journal of Environmental Management* **52**: 227–240.

Osborne, P. E., Alonso, J. C. and Bryant, R. G. (2001). Modelling landscape-scale habitat use using GIS and remote sensing: a case study with great bustards. *Journal of Applied Ecology* **38**: 458-471.

Osborne, P. E., Graña, L. S., Leitão, P. J. and Nagy, S. (2008). Modelling the distribution of Great Bustards and the potential challenges of climate change. *2nd Great Bustard Expert Meeting*. Fedosia, Ukraine.

Palacin, C. (2007). Comportamiento migratorio de la Avutarda Común en la Península Ibérica. *Facultad de Ciencias Biológicas*. Madrid, Universidad Complutense de Madrid. **Ph.D.**

Palacin, C., Alonso, J., Alonso, J., Martin, C., Magana, M. and Martin, B. (2009). Differential Migration by Sex in the Great Bustard: Possible Consequences of an Extreme Sexual Size Dimorphism. *Ethology* **115**(7): 617-626.

Palacin, C. and Alonso, J. C. (2008). An updated estimate of the world status and population trends of the Great Bustard Otis tarda. *Ardeola* **55**(1): 13-25.

Pinto, M., Rocha, P. and Moreira, F. (2005). Long-term trends in great bustard (*Otis tarda*) populations in Portugal suggest concentration in single high quality area. *Biological Conservation* **124**(3): 415-423.

Pitra, C., Lieckfeldt, D. and Alonso, J. C. (2000). Population subdivision in Europe's great bustard inferred from mitochondrial and nuclear DNA sequence variation. *Molecular Ecology* **9**(8): 1165-1170.

Quaisser, C., Lechner- Doll, M., Litzbarski, H. and Pitra, C. (1998). Wieviel Nahrung benötigt ein Großtrappen-Küken (Otis tarda)? *Artenschutzreport* **45-47**.

Raab, R., Julius, E., Spakovszky, P. and Nagy, Sz. (2009). Guidelines for best practice on mitigating impacts of infrastructure development and afforestation on the Great Bustard. Bonn, CMS Secretariat**:** 29.

Raab, R., Schütz, C., Spakovszky, P., Julius, E. and Schulze, C.H. (2012). Underground cabling and marking of power lines: conservation measures rapidly reduced mortality of West -Pannonian Great Bustards Otis tarda. *Bird Conservation International*, 22, pp 299-306 doi:10.1017/S0959270911000463

Reiter, A. S. (2000). Grosstrappen (Otis tarda L.) verungluecken an Stromleitungen im westlichen Weinviertel (Niederoesterreich). *Egretta* **43**(1): 37-54.

Rocha, P. (2006). Dinâmica Populacional e Distribuição da Abetarda no Baixo-Alentejo - Relação com o uso da Terra. Tese de doutoramento. ISA/UTL.

Sastre, P., Ponce, C., Palacín, C., Martín, C. and Alonso, J. (2009). Disturbances to great bustards (Otis tarda) in central Spain: human activities, bird responses and management implications. *European Journal of Wildlife Research* **55**(4): 425-432.

Sprick, P. (1999). Zur Nahrungsökologie der Großtrappen (Otis tarda L.) in brachedurchsetzten Agrarlandschaften Ostdeutschlands. *Mitt. Biol. Bundesanstalt Land- Forstwirtsch. Berlin-Dahlem* **368**: 189-206.

Sterbetz, I. (1978). Magyarország túzokállománya (Otis t. tarda) 1977-ben. *Állattani Közlemények* **65**(1-4): 127-136.

Sterbetz, I. (2000). A túzok (Otis tarda) egy dél-alföldi állományának ötven éves vizsgálata. *Aquila* **105-106**: 71-75.

Streich, W., Litzbarski, H., Ludwig, B. and Ludwig, S. (2006). What triggers facultative winter migration of Great Bustard (Otis tarda) in Central Europe? *European Journal of Wildlife Research* **52**(1): 48-53.

Streich, W. J. (2007). Population Threat Analysis of the Great Bustard in the Saratov Region. *Bustard Studies* **6**.

Streich, W. J., Pitra, C., Litzbarski, H. and Quaisser, C. (1996). Zur Populationsdynamik der Großtrappe (Otis t. tarda L., 1758) – eine Computersimulation. *Naturschutz und Landschaftspflege in Brandenburg* **5**: 91-94.

Streich, W. J. L., H.; Eisenberg, A.; Langgemach, T. (2000). Great Bustard - no future in Germany? A population viability analysis. *Advances in Ethology* **35**(Suppl. ): 153S.

Watzke, H. (2007). Reproduction and Causes of Mortality in the Breeding Area of the Great Bustard in the Saratov Region of Russia. *Bustard Studies* **6**.

## ANNEX 1

### Threats important at population/group of countries level

|  |  |  |  |
| --- | --- | --- | --- |
| **Type of threat** | **German-Polish Plain** | **Carpathian Basin** | **Steppe zone** |
| Loss of undisturbed open habitats with suitable vegetation structure | Critical | Medium | High |
| Collision with powerlines and wind turbines, railway cables | High | High | High |
| Destruction of eggs or chicks during agricultural works | High | High | Medium |
| Predation of eggs, chicks or juveniles | High | High | Medium |
| Insufficient invertebrate food supply | Medium | Medium | Unknown |
| Poaching | Low | Low | High |
| Catastrophic mortality in harsh winters | Medium | Medium | High |
| Disturbance | Low | Low | Low |
| Climate change | Low | Medium | Medium |

Notes:

* *The description of threats should reflect the actual understanding of the situation with the species, according to the latest available knowledge and the workshop participants’ best judgment. It is not necessary to follow a formal threat classification system. The logical problem analysis and cause-effect relationships among the main threats are the important aspects to focus the plan on.*
* *Threats are not hierarchical, but clustered according to type of effect.*
* *Threat score: Critical, High, Medium, Low, Local, Unknown.*

# **ANNEX 2**

### Key sites for conservation of the species (Important Bird Areas) in the EU and their protection status

| **Country** | **IBA National name** | **Pop. min** | **Pop. max** | **Year** | **Season** | **Quality** | **IBA Area (km2)** | **SPA Code** | **SPA name**  **(EU only)** | **% of IBA protected/ overlap** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Austria**  **Austria**  **Austria**  **Austria** | Österreichischer Teil des Hanság | 14 (6 m, 8 f) | 31 (14 m, 22 f) | 2017 | resident | good | 44.81 | AT1126129 | Waasen - Hanság | 66.99% |
| Parndorfer Platte und Heideboden | 343 (105 m, 238 f) | 425 (146 m, 279 f) | 2017 | resident | good | 278.56 | AT1125129 | Parndorfer Platte und Heideboden (in process of designation) | 26% |
| Westliches Weinviertel | 49 (18 m, 31 f) | 52 (20 m, 32 f) | 2017 | resident | good | 316.19 | AT1209V00 | Westliches Weinviertel | 53.46% |
| Zentrales Marchfeld | 4 (0 m, 4 f) | 5 (1 m, 4 f) | 2017 | resident | good | 345.43 | AT1213V00 | Sandboden und Praterterrasse | 46.37% |
| **Germany** | Unteres Rhinluch-Dreetzer See / Havelländisches Luch / Belziger Landschaftswiesen | 158 | 158 | 2017 | resident | good | 158.05 | DE3341401 | Unteres Rhinluch-Dreetzer See / Havelländisches Luch / Belziger Landschaftswiesen | 88% |
| Fiener Bruch | 80 | 80 | 2017 | resident | good | 86,35 | DE3640-421  DE3639401 | Fiener Bruch | 86 % |
| **Hungary** | Hortobágy es Tisza-to | 90 | 110 | 2017 | breeding | good | 921.82 | HUHN10002 | Hortobágy | 70.81% |
| Felső-kiskunsági szikes puszták | 500 | 550 | 2017 | breeding | good | 419.02 | HUKN10001 | Felső-kiskunsági szikes puszták és turjánvidék | 79.10% |
| Kolon-tó | 2 | 9 | 2017 | breeding | good | 35.77 | HUKN30003 | Izsáki Kolon-tó | 92.20% |
| Dévaványai Ecsegi-puszták | 500 | 560 | 2017 | breeding | good | 286.97 | HUKM10003 | Dévaványai-sík | 87.09% |
| Kis-Sárrét (Biharugra terseg) | 40 | 100 | 2017 | breeding | good | 72.28 | HUKM10002 | Kis-Sárrét | 58.65% |
| Borsodi-Mezőség | 0 | 7 | 2017 | breeding | good | 369.28 | HUBN10002 | Borsodi-sík | 94.64% |
| Bihari-síkság | 90 | 110 | 2017 | breeding | good | 446.56 | HUHN10003 | Bihar | 87.76% |
| Mosoni-sík | 30 | 50 | 2017 | breeding | good | 60.26 | HUFH10004 | Mosoni-sík | 81.22% |
| Hevesi-sík | 0 | 5 | 2017 | breeding | good | 604.53 | HUBN10004 | Hevesi-sík | 82.78% |
| Vasarhelyi puszta, Csanádi hat | 20 | 30 | 2017 | breeding | good | 98.97 | HUKM10004 | Vásárhelyi- és Csanádi-puszták | 98.14% |
| Kiskunsági szikes tavak és az őrjegi turjánvidék | 50 | 65 | 2017 | breeding | good | 357.48 | HUKN10002 | Kiskunsági szikes tavak és az őrjegi turjánvidék |  |
| **Portugal** | Castro Verde | 1413 | 1413 | 2009 | breeding | high | 835.79 | PTZPE0046 | Castro Verde | 102.11% |
| Vila Fernando/Veiros | 31 | 31 | 2009 | breeding | high | 20.15 | PTZPE0052 | Veiros | 97,22% |
| Vila Fernando/Veiros | 52 | 52 | 2009 | breeding | high | 54.72 | PTZPE0053 | Vila Fernando | 96.13% |
| Planície de Monforte | 43 | 43 | 2009 | breeding | high | 15.94 | PTZPE0051 | Monforte | 118.32% |
| Mourão, Moura e Barrancos | 2 | 2 | 2009 | breeding | high | 896.47 | PTZPE0045 | Mourão, Moura e Barrancos | 94.74% |
| Alter do Chão | 12 | 12 | 2009 | breeding | high | 13.17 | --- | ---- | 0.00 |
| Planície de Évora | 21 | 21 | 2009 | breeding | high | 531.34 | PTZPE0055 | Évora | 27.68 |
| Serra de Penha Garcia e Campina de Toulões | 0 | 0 | 2005 | breeding | high | 156.79 | ---- | ----- | 0.00 |
| Campo Maior | 103 | 103 | 2009 | breeding | high | 95.77 | PTZPE0043 | Campo Maior | 100.03% |
| Cuba | 89 | 89 | 2009 | breeding | high | 50.49 | PTZPE0057 | Cuba | 80.83% |
| Rio Guadiana | 36 | 36 | 2009 | breeding | high | 765.78 | PTZPE0047 | Vale do Guadiana | 99.96% |
| Torre da Bolsa | 22 | 22 | 2009 | breeding | high | 27.20 |  | Torre da Bolsa | 31.94% |
| - | 42 | 42 | 2009 | breeding | high | 0.00 | PTZPE0058 | Piçarras | --- |
| São Pedro de Solis | 27 | 27 | 2009 | breeding | high | 143.14 | ---- | --- | 0.00% |
| **Slovakia** | Syslovské polia | 0 | 3 | 2017 | resident | good | 19.29 | SKCHVU029 | Syslovské polia | 90% |
| Lehnice | 0 | 1 | 2017 | resident | good | 26.60 | SKCHVU012 | Lehnice | 88.2% |
| **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain**  **Spain** | Villafáfila | 1026 | 2198 | 1996 | breeding |  | 327.34 | ES0000004 | Lagunas de Villafáfila | 99.01% |
| Embalse del Esla | 44 | 44 | 1995 | breeding |  | 266.81 | ES0000004 | Lagunas de Villafáfila | 0.03% |
| Belver de los Montes-Gallegos del Pan | 200 | 250 | 1996 | breeding |  | 444.78 | ES0000004 | Lagunas de Villafáfila | 32.06% |
| Tordesillas - Mota del Marqués | 100 | 100 | 1996 | breeding |  | 210.78 | #N/A | #N/A | Unknown |
| Fuentelapeña-Jambrina | 150 | 250 | 1996 | breeding |  | 250.97 | ES0000208 | Llanuras del Guareña | 95.94% |
| Páramos del Cerrato | 120 | 150 | 1996 | breeding |  | 859.19 | #N/A | #N/A | Unknown |
| Talamanca-Camarma | 484 | 484 | 1996 | breeding |  | 535.84 | ES0000139 | Estepas cerealistas de los ri­os Jarama y Henares | 66.16% |
| Cortados del Jarama | 25 | 35 | 1996 | breeding |  | 248.44 | ES0000142 | Cortados y cantiles de los ri­os Jarama y Manzanares | 88.77% |
| Campo de Calatrava | 100 | 100 | 1996 | breeding |  | 1,021.15 | ES0000157 | Area esteparia del Campo de Calatrava | 6.59% |
| Pétrola-Almansa-Yecla | 176 | 176 | 1994 | breeding |  | 794.52 | ES0000153 | Area esteparia del este de Albacete | 33.80% |
| Campo de Montiel | 23 | 230 | 1996 | breeding |  | 1,381.01 | ES0000154 | Zona esteparia de El Bonillo | 15.86% |
| San Clemente-Villarrobledo | 37 | 120 | 1994 | breeding |  | 1,073.34 | ES0000390 | San Clemente | 8.69% |
| Tarancón-Ocaña-Corral de Almaguer | 419 | 579 | 1994 | breeding |  | 1,299.53 | ES0000170 | Area esteparia de La Mancha norte | 33.98% |
| Llanos de Tembleque-La Guardia | 707 | 1205 | 1995 | breeding |  | 1,288.91 | ES0000170 | Area esteparia de La Mancha norte | 42.26% |
| Complejo lagunar de Alcázar de San Juan-Quero | 14 | 27 | 1994 | breeding | good | 585.00 | #N/A | #N/A | Unknown |
| Torrijos | 139 | 201 | 1994 | breeding |  | 296.43 | ES0000435 | Áreas esteparia de la margen derecha del rio Guadarrama | 42.88% |
| Llanos de Oropesa | 24 | 50 | 1994 | breeding |  | 456.80 | ES0000089 | Valle del Tietar y embalses de Rosarito y Navalcan | 42.76% |
| Embalse del Borbollón | 40 | 50 | 1995 | breeding |  | 482.47 | ES0000326 | Embalse del Borbollón | 1.96% |
| Embalse de Alcántara-Cuatro Lugares | 150 | 3000 | 1996 | breeding |  | 1,220.12 | ES0000014 | Monfrague y las dehesas del entorno | 26.48% |
| Sierra de Pela-Embalse de Orellana-Zorita | 448 | 448 | 1995 | breeding |  | 1,434.65 | ES0000068 | Embalse de Orellana y Sierra de Pela | 54.85% |
| Trujillo-Torrecillas de la Tiesa | 300 | 300 | 1996 | breeding |  | 1,064.43 | ES0000014 | Monfrague y las dehesas del entorno | 17.48% |
| Llanos entre Cáceres y Trujillo-Aldea del Cano | 1300 | 1300 | 1996 | breeding |  | 1,062.29 | ES0000071 | Llanos de Cáceres y Sierra de Fuentes | 71.16% |
| Malpartida de Cáceres-Arroyo de la Luz | 25 | 70 | 1996 | breeding |  | 458.86 | ES0000070 | Sierra de San Pedro | 0.22% |
| Brozas-Membrío | 500 | 800 | 1996 | breeding |  | 984.83 | ES0000368 | Rio Tajo internacional y riberos | 3.76% |
| Sierra de San Pedro | 150 | 150 | 1996 | breeding |  | 3,070.94 | ES0000069 | Embalse de Cornalvo y Sierra Bermeja | 44.60% |
| Lácara-Morante | 0 | 10 | 1997 | resident | medium | 569.00 | #N/A | #N/A | unknown |
| Botoa-Villar del Rey | 332 | 332 | 1995 | breeding |  | 483.82 | PTZPE0043 | Campo maior | 0.30% |
| Olivenza-La Albuera | 1500 | 1500 | 1996 | breeding |  | 807.11 | ES0000398 | Llanos y complejo lagunar de la Albuera | 29.77% |
| Villanueva del Fresno | 320 | 320 | 1995 | breeding |  | 97.72 | ES4310004 | Dehesas de Jerez | 97.65% |
| Fuente de Cantos-Montemolín | 30 | 30 | 1996 | resident | medium | 490.00 | #N/A | #N/A | 0 |
| Bienvenida-Usagre-Ribera del Fresno | 0 | 600 | 1996 | breeding |  | 547.63 | ES0000325 | Campiña sur - embalse de arroyo conejos | 0.04% |
| Azuaga-Llerena-Peraleda de Zaucejo | 1500 | 1500 | 1996 | breeding |  | 1,550.53 | ES0000325 | Campiña sur - embalse de arroyo conejos | 28.19% |
| La Serena | 800 | 800 | 1996 | breeding |  | 1,059.98 | ES0000068 | Embalse de Orellana y Sierra de Pela | 92.23% |
| Estepas de Monegrillo-Pina | 10 | 20 | 1997 | breeding |  | 462.99 | ES0000180 | Estepas de Monegrillo y Pina | 52.23% |
| Los Monegros (Sur) | 75 | 80 | 1996 | breeding |  | 483.90 | ES0000180 | Estepas de Monegrillo y Pina | 60.05% |
| Laguna de Gallocanta | 52 | 52 | 1995 | breeding |  | 301.42 | ES0000017 | Cuenca de Gallocanta | 51.67% |
| Los Blázquez - La Granjuela - Fuenteovejuna | 20 | 20 | 1992 | breeding |  | 346.90 | #N/A | #N/A | 0 |
| Campiña de Carmona | 0 | 22 | 1996 | breeding |  | 353.29 | #N/A | #N/A | 0 |
| Condado - Campiña | 10 | 10 | 1996 | breeding |  | 568.33 | #N/A | #N/A | 0 |
| Campiña alta de Córdoba | 30 | 30 | 1996 | breeding |  | 1,179.16 | #N/A | #N/A | 0 |
| Tierra de Campos | 2000 | 2500 | 1997 | breeding |  | 2,680.20 | ES0000194 | Oteros-campos | 47.01% |
| Tierra de Campiñas | 2300 | 2500 | 1992 | breeding |  | 1,889.81 | ES0000204 | Tierra de Campiñas | 75.34% |
| Altos de Barahona | 46 | 50 | 1996 | breeding |  | 288.47 | ES0000203 | Altos de Barahona | 99.26% |
| Carrión-Frómista | 300 | 400 | 1996 | breeding |  | 570.86 | ES0000201 | Camino de Santiago | 39.79% |
| Topas | 73 | 150 | 1997 | breeding |  | 292.00 | #N/A | #N/A | 0 |
| Carrizales y Sotos de Aranjuez | 20 | 24 | 1994 | breeding |  | 185.08 | ES0000119 | Carrizales y sotos de Aranjuez | 84.74% |
| Alange | 36 | 100 | 1996 | breeding |  | 662.02 | ES0000072 | Sierra Grande de Hornachos | 20.89% |
| Don Benito-Guareña | 50 | 60 | 1996 | breeding |  | 338.28 | ES0000367 | La Serena y sierras perifericas | 0.08% |
| Alcarria de Alcalá | 80 | 120 | 1997 | breeding |  | 72.15 | #N/A | #N/A | 0 |
| Llanura cerealista de Ecija-Osuna | 0 | 50 | 1996 | breeding |  | 628.60 | ES6180002 | Complejo endorreico la Lantejuela | 1.43% |
| Andévalo Occidental | 40 | 40 | 1996 | breeding |  | 495.33 | #N/A | #N/A | 0 |
| Villalba de los Barros | 200 | 200 | 1996 | breeding |  | 141.11 | ES0000398 | Llanos y complejo lagunar de la Albuera | 41.05% |

### Key sites for the conservation of the species outside of the EU

| **Country** | **IBA Code** | **IBA Name** | **Pop. min** | **Pop. max** | **Year** | | | **IBA Area (km²)** | **Protection status** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Kazakhstan** | (blank) | Aksu-Dzhabagly State Nature Reserve | 0 | 0 | 2004 | | 0 | 1,319 | Fully Protected |
| (blank) | Arystandy | 123 | 500 | 2004 | | 2004 | 198 | Not Protected |
| (blank) | Irgiz-Turgay Lakes | 0 | 0 | 1986 | | 0 | 3,480 | Fully Protected |
| (blank) | Tentek River Delta | 15 | 30 | 2007 | | 0 | 459 | Partially Protected |
| (blank) | Zhusandala | 0 | 0 | 2001 | | 2006 | 2,171 | Fully Protected |
| **Russia (European)** | RU355 | Balka Yablonya | 11 | 21 | 2013 | | 2013 | 187 | Not Protected |
| RU164 | Dadynskiye lakes | 0 | 200 | 1996 | | 0 | 450 | Not Protected |
| RU278 | Drofinyi area | 10 | 15 | 2007 | | 2007 | 792 | Fully Protected |
| RU481 | Dudarevskaya steppe | 4 | 40 | 1998 | 1998 | | 300 | Not Protected |
|  |  | 20 | 200 |  |  | |  | Not Protected |
| RU366 | Estonka site | 7 | 0 | 2013 | 2013 | | 17 | Not Protected |
| RU359 | Fields near village Voskresenka | 19 | 21 | 2008 | 2008 | | 36 | Not Protected |
| RU381 | Irgaklinski forest | 0 | 200 | 1996 | 1999 | | 24 | Partially Protected |
| RU479 | Kholmanskiye feathergrass steppes | 52 | 0 | 1999 | 1999 | | 656 | Partially Protected |
| RU364 | Kumysni pond site | 9 | 17 | 2008 | 2008 | | 21 | Not Protected |
| RU389 | Kurnikov liman | 20 | 50 | 1997 | 2005 | | 16 | Not Protected |
| RU394 | Outskirts of Arbali village | 150 | 200 | 2005 | 2006 | | 16 | Not Protected |
| RU365 | Outskirts of village Il'inka | 5 | 0 | 2013 | 2013 | | 21 | Not Protected |
| RU369 | Outskirts of village Lepekhinka | 7 | 12 | 2008 | 2008 | | 22 | Not Protected |
| RU367 | Outskirts of village Pervomaiskoye | 24 | 29 | 2008 | 2008 | | 260 | Not Protected |
| RU360 | Outskirts of village Rekord | 3 | 6 | 2013 | 2013 | | 19 | Not Protected |
| RU368 | Outskirts of village Timofeevo | 8 | 0 | 2013 | 2013 | | 21 | Not Protected |
| RU137 | Rovno area | 2 | 4 | 2013 | 2013 | | 82 | Not Protected |
| RU370 | Shcherbakovskaya bend of Volga river (it was mentioned in migrating birds) | 100 | 150 | 2000 | 2001 | | 356 | Fully Protected |
| RU128 | Siniye mountains | 0 | 0 | 2013 | 2013 | | 126 | Not Protected |
| RU358 | Steppes in the vicinity of Zeleni Dol village (area was united with another one) | 4 | 8 | 2013 | 2013 | | 479 | Not Protected |
| RU250 | Tazhinski liman | 9 | 10 | 2007 | 2007 | | 96 | Partially Protected |
| RU127 | Valley of Safarovka river | 1 | 2 | 2008 | 2008 | | 205 | Not Protected |
| RU126 | Vicinity of Borisoglebovka (Saratovski [Semenovski] Reserve) (area was united with another one) | 91 | 0 | 2008 | 0 | | 1023 | Partially Protected (PA is 43% since 2001) |
| RU475 | Vicinity of Poltavka village | 53 | 80 | 1999 | 1999 | | 96 | Not Protected |
| RU132 | Vicinity of Voznesenk village | 5 |  | 2001 | 0 | | 87 | Not Protected |
| RU357 | Vicinity of Eruslan village | 4 |  | 2008 | 2008 | | 244 | Not Protected |
| RU118 | Vorono-Khoperski area | 10 | 17 | 2007 | 0 | | 240 | Not Protected |
| RU361 | Yasnaya Polyana site | 11 | 0 | 2013 | 2013 | | 250 | Not Protected |
| RU157 | Yeiski salt-lakes (data about WINTERING birds) | 500 | 500 | 1996 | 0 | | 240 | Not Protected |
| RU139 | Zhestyanka | 2 | 4 | 2013 | 0 | | 121 | Not Protected |
| RU323 | Zolotarevskaya area | 5 | 7 | 2007 | 2007 | | 749 | Partially Protected (PA is 30.34% since 2006) |
| **Serbia** | YU011 | Jazovo-Mokrin | 10 | 14 | 2017 | 0 | | 80 | Partially Protected |
| **Turkey** | AKD016 | Acıgöl | 30 | 40 |  |  | | 327 | Partially Protected |
| GDA005 | Akçakale Steppes | 45 | 50 | \* |  | | 1,072 |  |
| ORT002 | Aliken | 40 | 60 | 1996 |  | | 197 | Not Protected |
| EGE032 | Altıntaş plain | 40 | 50 | 1997 |  | | 196 | Partially Protected |
| GDA013 | Bismil plain | 30 | 35 | \* |  | | 1,244 | Not Protected |
| DOG035 | Bulanık and Malazgirt plains | 150 | 250 | 2002 |  | | 333 | Not Protected |
| GDA010 | Ceylanpınar | 15 | 30 | \* |  | | 3,845 | Not Protected |
|  |  | 800 | 1000 | 1981 |  | |  | Not Protected |
| ORT017 | Çöl lake and Çalikdüzü | 35 | 45 | 2000 |  | | 422 | Not Protected |
| ORT030 | Ereğli Plan | Present |  |  |  | | 1,294 |  |
| DOG017 | Karasu plain | 35 | 35 | \* |  | | 262 | Not Protected |
| DOG046 | Kavuştuk peninsula | 31 | 35 | \* |  | | 141 | Not Protected |
| DOG038 | Muş Plain | 36 | 46 | 2002 |  | | 196 | Not Protected |
| DOG034 | Patnos | 31 | 31 | \* |  | | 194 | Not Protected |
| ORT006 | Polatlı - TİGEM | 15 | 30 | 2004 |  | | 845 | Not Protected |
| ORT016 | Samsam lake | 20 | 30 | 1998 |  | | 42 | Partially Protected |
| ORT010 | Sarayönü | 40 | 60 | 1998 |  | | 353 | Not Protected |
| ORT033 | Seyfe lake | 30 | 30 | \* |  | | 463 | Fully Protected |
| ORT024 | Tuz lake | 83 | 110 | 2000 |  | | 5,330 | Partially Protected |
| DOG033 | Upper Murat Valley | 30 | 40 | 2000 |  | | 182 | Not Protected |
| DOG053 | Van plains | 26 | 35 | \* |  | | 1,029 | Not Protected |
| ORT034 | Yenipazar | 32 | 44 | \* |  | | 328 | Not Protected |
| DOG068 | Yüksekova | 30 | 40 | \* |  | | 286 | Not Protected |
| **Ukraine** | UA112 | Agricultural lands near Bilorets'ke (Chornozemne village) | 200 | 500 | 1999 | 0 | | 170 | Not Protected |
| UA102 | Bagerove | 110 | 120 | 1995 | *breeding/wintering* | | 205 | Not Protected |
|  |  | 20 | 0 | 1996 | 0 | |  | Not Protected |
| UA096 | Bilogir'ya | 30 | 80 | 1999 | *breeding/wintering* | | 320 | Not Protected |
| UA135 | Chauda | 120 | 130 | 1999 | *breeding/wintering* | | 560 | Not Protected |
|  |  | 300 | 3500 |  |  | |  | Not Protected |
| UA113 | Gajchur river valley | 80 | 100 | 1999 | 0 | | 240 | Not Protected |
| UA115 | Kakhovs'ke reservoir (Energodar) | 60 | 60 | 1999 | 0 | | 280 | Not Protected |
| UA069 | Syvash Bay | 0 | 1000 | 2010 | *breeding/wintering* | | 2,450 | Partially Protected |
|  |  | 2 | 3 |  |  | |  | Partially Protected |
| UA101 | Uzunlars'ke lake | 500 | 0 | 1994 | *breeding/wintering* | | 96 | Not Protected |
|  |  | 0 | 70 | 1996 | 0 | |  | Not Protected |
| UA065 | Yagorlyts'ka and Tendrivs'ka Bays | 5 | 50 | 1999 | 0 | | 720 | Fully Protected |
|  | Territories around the Biosphere Reserve Askania Nova | 0 | 1000 | 2010 | *Wintering* | |  | Partially protected |

***NOTES***

* ***Population Min - Max.*** *For breeding ('season' column), figures are usually given in pairs; for other seasons, figures are given in individuals*
* ***Season:*** *Breeding, Migration, Non-breeding visitor (wintering)*
* ***Accuracy: Good (Observed)*** *= based on reliable or representative quantitative data derived from complete counts or comprehensive measurements.****Good (Estimated)*** *= based on reliable or representative quantitative data derived from sampling or interpolation.****Medium (Estimated)*** *= based on incomplete quantitative data derived from sampling or interpolation.****Medium (Inferred)*** *= based on incomplete or poor quantitative data derived from indirect evidence.****Poor (Suspected)*** *= based on no quantitative data, but guesses derived from circumstantial evidence.*
* ***Protected Area name =*** *Nature Reserve, National Park, Ramsar site, etc.*
* **Type of protected area**: IUCN Category
* ***Protection status****: level of overlap between the IBA and a National protected area or International designation.*

## ANNEX 3

National legal status

|  |  |  |
| --- | --- | --- |
| **Country** | **Legal protection** | **For game species, give opening/closing dates** |
| *Albania* | Protected |  |
| *Austria* | Protected | Closed throughout the year |
| *Armenia* | Protected |  |
| *Azerbaijan* | Protected |  |
| *Bosnia-Herzegovina* | Protected | Closed throughout the year |
| *Bulgaria* | Protected |  |
| *Czech Republic* | Protected |  |
| *Germany* | Protected | Closed throughout the year |
| *Georgia* | Protected |  |
| *Greece* | Protected |  |
| *Hungary* | Protected |  |
| *Italy* | Protected |  |
| *Montenegro* |  |  |
| *Poland* | Protected |  |
| *Portugal* | Protected |  |
| *Republic of Moldova* | Protected |  |
| *Romania* | Protected | Law n. 407 (year 2006) Hunting and protection of hunting fund |
| *Russian Federation* | Protected | In 2013 there was an attempt to exclude the western subspecies out from new edition of the Russian Red Book |
| *Serbia* | Protected |  |
| *Slovakia* | Protected | Closed throughout the year |
| *Slovenia* | Protected |  |
| *Spain* | Protected |  |
| *The FYR of Macedonia* | Protected |  |
| *Turkey* | Protected |  |
| *Ukraine* | Protected |  |
| *United Kingdom* | Protected | Closed throughout the year |

### Recent conservation measures

|  |  |  |
| --- | --- | --- |
| **Country** | **Is there a national action plan for the species?** | **Is there a national project / working group?** |
| *Albania* | Yes | No |
| *Austria* | Yes | Yes |
| *Armenia* | No | No |
| *Azerbaijan* | No | No |
| *Bosnia-Herzegovina* | No | No |
| *Bulgaria* | No | No |
| *Croatia* | Yes | No |
| *Czech Republic* | No | No |
| *Germany* | No | Yes |
| *Georgia* | No | No |
| *Greece* | No | No |
| *Hungary* | Yes | Yes |
| *Italy* | No | No |
| *Portugal* | No | No |
| *Republic of Moldova* | No | No |
| *Romania* | No | No |
| *Russia* | No | No |
| *Serbia* | No | Yes |
| *Slovenia* | No | No |
| *Slovakia* | Yes | Yes |
| *Spain* | No | Yes |
| *The FYR of Macedonia* | Yes | No |
| *Turkey* | No | No |
| *Ukraine* | Yes | No |
| *United Kingdom* | No | Yes |

### Ongoing monitoring schemes for the species

|  |  |  |
| --- | --- | --- |
| **Country** | **Is there a national survey / monitoring programme?** | **Is there a monitoring programme in protected areas?** |
| *Albania* | *No* | *No* |
| *Austria* | *Yes* | *Yes* |
| *Armenia* | *No* | *No* |
| *Azerbaijan* | *No* | *No* |
| *Bulgaria* | *No* | *No* |
| *Bosnia-Herzegovina* | *No* | *No* |
| *Croatia* | *No* | *No* |
| *Czech Republic* | *Yes* | *No* |
| *Germany* | *Yes* | *Yes* |
| *Georgia* | *No* | *No* |
| *Greece* | *No* | *No* |
| *Hungary* | *Yes* | *Yes* |
| *Italy* | *No* | *No* |
| *Portugal* | *Yes* | *Yes* |
| *Romania* | *No* | *No* |
| *Moldova* | *No* | *No* |
| *Russian Federation* | *No* | *Yes* |
| *Serbia* | *No* | *Yes* |
| *Slovakia* | *Yes* | *Yes* |
| *Spain* | *Yes* | *Yes* |
| *Slovenia* | *No* | *No* |
| *The FYR of Macedonia* | *No* | *No* |
| *Turkey* | *No* | *No* |
| *Ukraine* | *No* | *Yes* |
| *United Kingdom* | *Yes* | *Yes* |

### Overview of the coverage of the species in networks of sites with legal protection status

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Country** | **National population size** | **Percentage of national population included in IBAs** | **Percentage of population included in Ramsar sites** | **Percentage of national population included in SPAs** | **Percentage of national population included in protected areas under national law** |
| ***Austria*** | 368–481 | >90% | n/a | <50% | <10% |
| ***Germany*** | 238 | 100% | n/a | 100% | 80% |
| ***Hungary*** | 1,596 | >90% | n/a | >90% | >50% |
| ***Portugal*** | 1,893 | ~100% | n/a | >90% |  |
| ***Russian Federation*** | 2,500-3,000 | >25%,<50% | n/a |  | >20%, <40% |
| ***Serbia*** | 10–14 | >90% | n/a | N/A | >750% |
| ***Slovakia*** | 0–3 | 100% | n/a | 100% | 100% |
| ***Spain*** | 27,500–33,000 | >50%, <75% | n/a | >50%, <75% |  |
| ***Turkey*** | 762–1,250 | >90% | n/a |  | >10%, <25% |
| ***Ukraine*** | <500 | <10% | n/a |  | <5% |

* *The data in this table is presented only for countries with significant breeding populations, to which a site based approach is feasible.*

1. Only the north-west part of the country between the Ural River and the Russian border. [↑](#footnote-ref-2)
2. Central Europe includes the ecologically similar populations of the German-Polish Plain and of the Carpathian Basin. [↑](#footnote-ref-3)
3. In individuals. [↑](#footnote-ref-4)
4. In case of extinct populations, the approximate time of extinction is given. [↑](#footnote-ref-5)
5. The action plan guidelines (BirdLife International 2008a) require, in line with the IUCN Red List guidelines (IUCN S.S.C. 2001), the use of three generations or 10 years, whichever is longer. 10 years equals one generation (BirdLife International Datazone 2017). [↑](#footnote-ref-6)
6. Three generations would reflect historical numbers instead of the current importance of the country. Therefore, numbers refer to one generation. [↑](#footnote-ref-7)
7. Last known record [↑](#footnote-ref-8)
8. Blue colours mark threats mentioned in the previous European action plan (Kollar 1996) [↑](#footnote-ref-9)