# *Corvus frugilegus* (Rook)

# European Red List of Birds

# Supplementary Material

The European Union (EU28) Red List assessments were based principally on the official data reported by EU Member States to the European Commission under Article 12 of the Birds Directive in 2019-20. For the European Red List assessments, similar data were sourced from BirdLife Partners and other collaborating experts in other European countries and territories. For more information, see BirdLife International (2021).

**Contents**

Reported national population sizes and trends
Trend maps of reported national population data
Sources of reported national population data
Species factsheet bibliography

**Recommended citation**

BirdLife International (2021) European Red List of Birds. Luxembourg: Publications Office of the European Union.

**Further information**

http://datazone.birdlife.org/info/euroredlist
http://www.birdlife.org/europe-and-central-asia/european-red-list-birds-0
http://www.iucnredlist.org/regions/europe
http://ec.europa.eu/environment/nature/conservation/species/redlist/

**Data requests and feedback**

To request access to these data in electronic format, provide new information, correct any errors or provide feedback, please email science@birdlife.org.

**Table 1**. Reported national breeding population size and trends in Europe[1].

| Country (or territory)[2] | Population estimate | | | | Short-term population trend[5] | | | | Long-term population trend[5] | | | | Subspecific population (where relevant) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Size (pairs)[3] | Europe (%) | Year(s) | Method[4] | Direction[6] | Magnitude (%)[7] | Year(s) | Method[4] | Direction[6] | Magnitude (%)[7] | Year(s) | Method[4] | |
| Albania | 90–180 | <1 | 2007-2018 | partial | + | 100 | 2007-2018 | partial | + | 100 | 1980-2018 | expert | |
| Armenia | 6200–8900 | <1 | 2013-2018 | complete | + | 3 to 7 | 2007-2018 | complete | 0 | | 2003-2018 | partial | |
| Austria | 2100–2500 | <1 | 2013-2018 | complete | - | -30 to -15 | 2007-2018 | complete | + | 300 to 400 | 1981-2018 | complete | |
| Azerbaijan | 5000–50000 | <1 | 1996-2019 | expert | 0 | | 2013-2019 | expert | ? | | 1980-2019 | expert | |
| Belarus | 300000–400000 | 5 | 2010-2018 | partial | 0 | -10 to 10 | 2012-2019 | expert | 0 | 0 | 1980-2019 | expert | |
| Belgium | 20800–24000 | <1 | 2013-2018 | partial | 0 | -8 to 7 | 2008-2018 | partial | + | 160 to 200 | 1973-2018 | partial | |
| Bosnia & HG | 2500–6000 | <1 | 2015-2018 | complete | - | -10 to -5 | 2007-2018 | complete | - | -30 to -20 | 1980-2018 | partial | |
| Bulgaria | 2000–4000 | <1 | 2013-2018 | partial | - | -50 to -40 | 2000-2018 | expert | ? | | 1980-2018 | expert | |
| Croatia | 1400–1500 | <1 | 2012-2018 | deficient | ? | | 2007-2018 | deficient | ? | | 1980-2018 | deficient | |
| Czechia | 3200–4400 | <1 | 2014-2017 | complete | ? | | 2007-2018 | deficient | ? | | 1980-2018 | deficient | |
| Denmark | 85500–85600 | 1 | 2017 | partial | 0 | -3 to 43 | 2006-2017 | complete | 0 | -4 to 56 | 1980-2017 | complete | |
| Estonia | 8000–12000 | <1 | 2013-2017 | expert | 0 | | 2007-2018 | expert | 0 | | 1980-2018 | expert | |
| Finland | 1100–1300 | <1 | 2013-2018 | partial | 0 | | 2007-2018 | partial | 0 | | 1980-2018 | partial | |
| France | 200000–350000 | 4 | 2013-2018 | partial | - | | 2007-2018 | partial | - | | 2001-2018 | partial | |
| Georgia | 640–6400 | <1 | 2013-2017 | partial | ? | | | deficient | ? | | | | |
| Germany | 105000 | 1 | 2012-2016 | complete | + | | 2004-2016 | expert | + | | 1985-2016 | expert | |
| Greece | 500–2000 | <1 | 2015 | partial | 0 | | 2007-2018 | partial | ? | | 1980-2018 | deficient | |
| Hungary | 31800–31900 | <1 | 2016-2016 | complete | + | 35 to 72 | 2008-2018 | complete | - | | 1980-2018 | complete | |
| Rep. Ireland | 1130000–3230000 | 23 | 2011-2016 | complete | 0 | -1 to 10 | 2006-2016 | complete | 0 | | 1980-2016 | deficient | |
| Kosovo | 6000–8000 | <1 | 2007-2019 | partial | 0 | | 2007-2018 | partial | ? | | 1990-2018 | partial | |
| Latvia | 3900–4600 | <1 | 2013-2018 | complete | + | 233 to 237 | 2000-2018 | partial | - | | 1980-2017 | partial | |
| Lithuania | 23000–26000 | <1 | 2013-2018 | partial | 0 | | 2013-2018 | partial | - | -60 to -40 | 1980-2018 | partial | |
| Luxembourg | 3300–3500 | <1 | 2013-2018 | complete | 0 | 0 to 10 | 2007-2018 | complete | + | 90 to 110 | 1980-2018 | complete | |
| North Macedonia | 2000–5000 | <1 | 2014-2019 | expert | 0 | | 2007-2018 | expert | ? | | 1980-2019 | | |
| Moldova | 30000–40000 | <1 | 2014-2017 | partial | + | | 2007-2018 | partial | 0 | | 1990-2018 | expert | |
| Netherlands | 46000–53300 | <1 | 2013-2017 | complete | - | -31 to -21 | 2006-2017 | complete | + | 121 to 124 | 1980-2017 | complete | |
| Norway | 160–230 | <1 | 2013-2018 | complete | ? | | 2013-2018 | deficient | - | -75 to -55 | 1980-2018 | complete | |
| Poland | 183000–222000 | 3 | 2013-2018 | complete | - | -54 to -25 | 2007-2018 | complete | ? | | 1980-2018 | deficient | |
| Romania | 150000–200000 | 2 | 2013-2018 | expert | ? | -1 to 17 | 2008-2018 | complete | ? | | 1980-2018 | deficient | |
| Russia | 1700000–2600000 | 28 | 2007-2018 | partial | - | -49 to -30 | 2008-2018 | partial | - | -79 to -50 | 1980-2018 | partial | |
| Serbia | 29000–46000 | <1 | 2013-2018 | complete | - | -29 to -10 | 2007-2018 | complete | - | -49 to -30 | 1980-2018 | complete | |
| Slovakia | 7000–10000 | <1 | 2013-2018 | expert | - | -30 to -20 | 2007-2018 | expert | - | -60 to -40 | 1980-2018 | expert | |

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**Table 1**. Reported national breeding population size and trends in Europe[1].

| Country (or territory)[2] | Population estimate | | | | Short-term population trend[5] | | | | Long-term population trend[5] | | | | Subspecific population (where relevant) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Size (pairs)[3] | Europe (%) | Year(s) | Method[4] | Direction[6] | Magnitude (%)[7] | Year(s) | Method[4] | Direction[6] | Magnitude (%)[7] | Year(s) | Method[4] | |
| Slovenia | 150–200 | <1 | 2017-2017 | complete | + | 600 to 800 | 2004-2017 | partial | ? | | 1980-2018 | deficient | |
| Spain | 1300–1400 | <1 | 2011 | partial | - | | 2000-2011 | complete | 0 | | 1979-2011 | complete | |
| Sweden | 43000–53000 | <1 | 2013-2018 | partial | + | 20 to 40 | 2007-2018 | partial | + | 35 to 269 | 1980-2018 | partial | |
| Switzerland | 5800–7300 | <1 | 2013–2016 | complete | + | 100 to 270 | 2007-2018 | complete | + | 1587 to 2601 | 1990-2018 | complete | |
| Turkey | 220000–400000 | 4 | 2002-2012 | expert | ? | | 2008-2019 | deficient | ? | | 1980-2013 | deficient | |
| Ukraine | 500000–1500000 | 12 | 2015-2017 | partial | F | 15 to 20 | 2007-2019 | expert | F | 20 to 30 | 1980-2019 | expert | |
| United Kingdom | 866000–1110000 | 13 | 2016 | complete | - | -21 | 2004-2016 | complete | - | -29 to -13 | 1995-2016 | complete | |
| EU28 | 2920000–5530000 | 50 | | | | | | | | | | | |
| **Europe** | **5730000–10700000** | **100** | | | | | | | | | | | |

[1] See 'Sources' at end of factsheet, and for more details on individual EU Member State reports, see the Article 12 reporting portal at http://bd.eionet.europa.eu/article12/report.
[2] The designation of geographical entities and the presentation of the material do not imply the expression of any opinion whatsoever on the part of IUCN or BirdLife International concerning the legal status of any country, territory or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries.
[3] In the few cases where population size estimates were reported in units other than those specified, they were converted to the correct units using standard correction factors.
[4] The 'method used' (replacing the data 'quality' assessment in the 2015 European Red List) is reported as: a) Complete: complete survey or a statistically robust estimate; b) Partial: based mainly on extrapolation from a limited amount of data; c) Expert: based mainly on expert opinion with very limited data; d) Defficient: insufficient or no data available.
[5] The robustness of regional trends to the effects of any missing or incomplete data was tested using plausible scenarios, based on other sources of information, including any other reported information, recent national Red Lists, scientific literature, other publications and consultation with relevant experts.
[6] Trend directions are reported as: increasing (+); decreasing (-); stable (0); fluctuating (F); or unknown (?).
[7] Trend magnitudes are rounded to the nearest integer.

**Table 2**. Reported national wintering population sizes and trends in Europe[1]. Note that some countries within the species' wintering range did not report any data, and that only minimum totals are presented, to avoid double-counting of birds moving between countries.

| Country (or territory)[2] | Population estimate | | | | Short-term population trend[5] | | | | Long-term population trend[5] | | | | Subspecific population (where relevant) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Size (individuals)[3] | Europe (%) | Year(s) | Method[4] | Direction[6] | Magnitude (%)[7] | Year(s) | Method[4] | Direction[6] | Magnitude (%)[7] | Year(s) | Method[4] | |
| Czechia | 10000–100000 | 100 | 2014-2018 | expert | ? | | 2007-2018 | deficient | ? | | 1982-2018 | deficient | |
| EU28 | 10000–100000 | 100 | | | | | | | | | | | |
| **Europe** | **10000–100000** | **100** | | | | | | | | | | | |

[1] See 'Sources' at end of factsheet, and for more details on individual EU Member State reports, see the Article 12 reporting portal at http://bd.eionet.europa.eu/article12/report.
[2] The designation of geographical entities and the presentation of the material do not imply the expression of any opinion whatsoever on the part of IUCN or BirdLife International concerning the legal status of any country, territory or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries.
[3] In the few cases where population size estimates were reported in units other than those specified, they were converted to the correct units using standard correction factors.
[4] The 'method used' (replacing the data 'quality' assessment in the 2015 European Red List) is reported as: a) Complete: complete survey or a statistically robust estimate; b) Partial: based mainly on extrapolation from a limited amount of data; c) Expert: based mainly on expert opinion with very limited data; d) Defficient: insufficient or no data available.
[5] The robustness of regional trends to the effects of any missing or incomplete data was tested using plausible scenarios, based on other sources of information, including any other reported information, recent national Red Lists, scientific literature, other publications and consultation with relevant experts.
[6] Trend directions are reported as: increasing (+); decreasing (-); stable (0); fluctuating (F); or unknown (?).
[7] Trend magnitudes are rounded to the nearest integer.

# Trend maps

A symbol appears in each country where the species occurs: the shape and colour of the symbol represent the population trend in that country, and the size of the symbol corresponds to the proportion of the European population occurring in that country.

**KEY**

- Large increase (≥50%)
- Moderate increase (20–49%)
- Small increase (<20%)
- Increase of unknown magnitude
- Large decrease (≥50%)
- Moderate decrease (20–49%)
- Small decrease (<20%)
- Decrease of unknown magnitude
- Stable or fluctuating
- Unknown
- Present (no population or trend data)
- Extinct since 1980

Each symbol, with the exception of Present and Extinct, may occur in up to three different size classes, corresponding to the proportion of the European population occurring in that country.

- Large: ≥10% of the European population
- Medium: 1–9% of the European population
- Small: <1% of the European population

The designation of geographical entities and the presentation of the material do not imply the expression of any opinion whatsoever on the part of IUCN or BirdLife International concerning the legal status of any country, territory or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries.

**Figure 1.** Breeding population sizes and short-term trends across Europe.

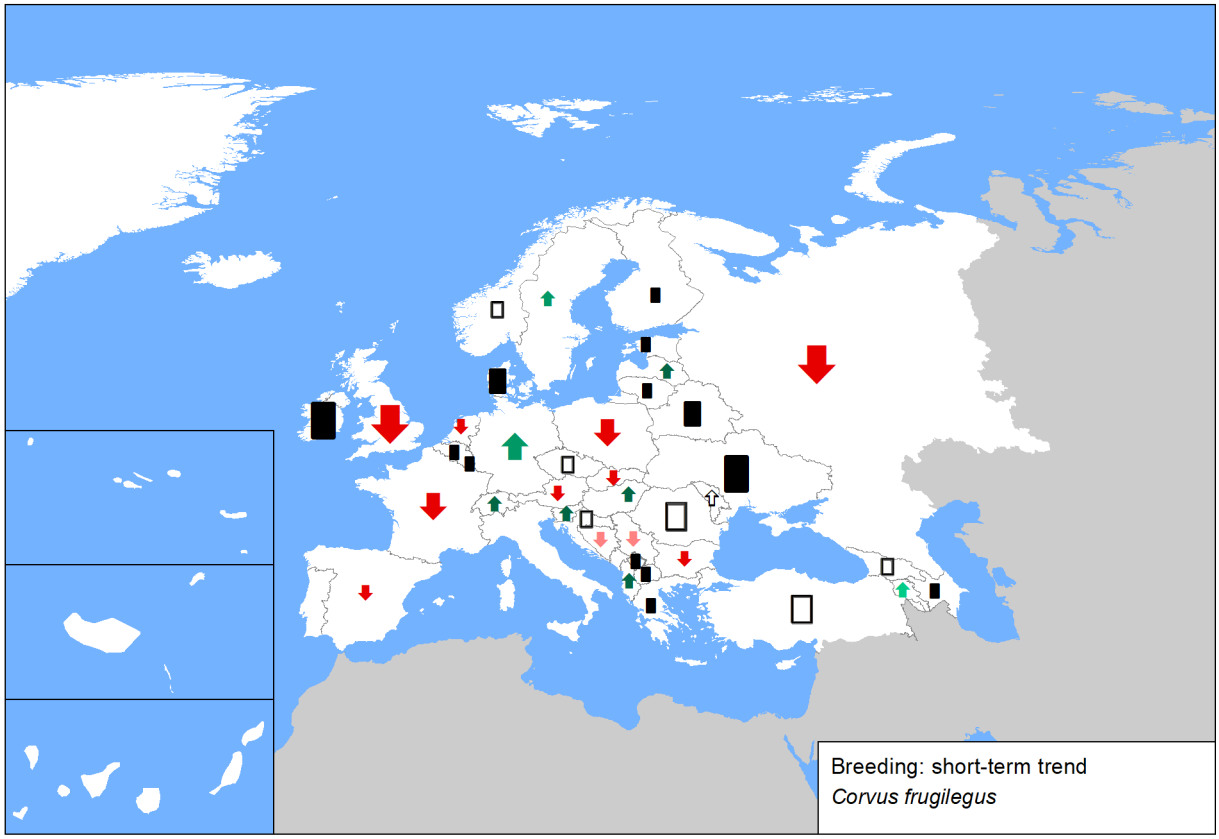



**Figure 2.** Breeding population sizes and long-term trends across Europe.

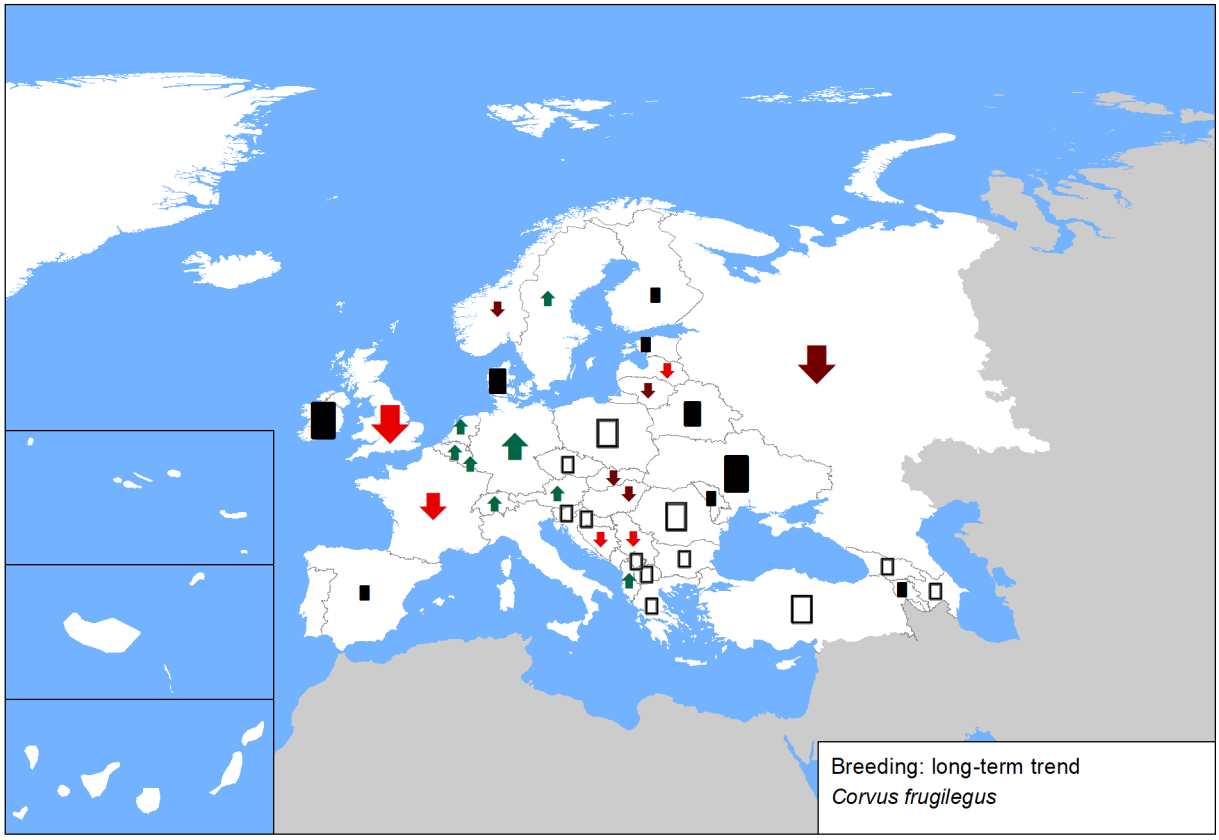


**Figure 3.** Reported wintering population sizes and short-term trends across Europe. Note that some countries within the species' wintering range did not report any data.

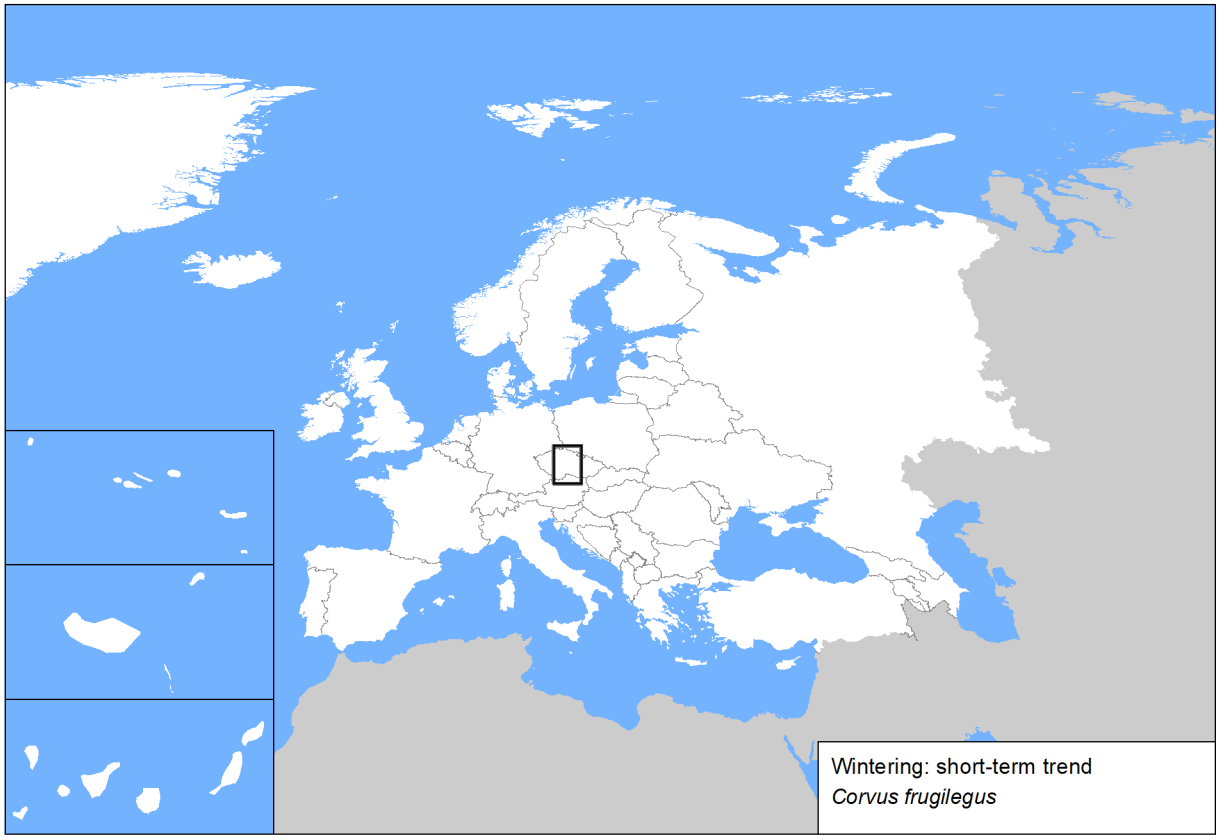
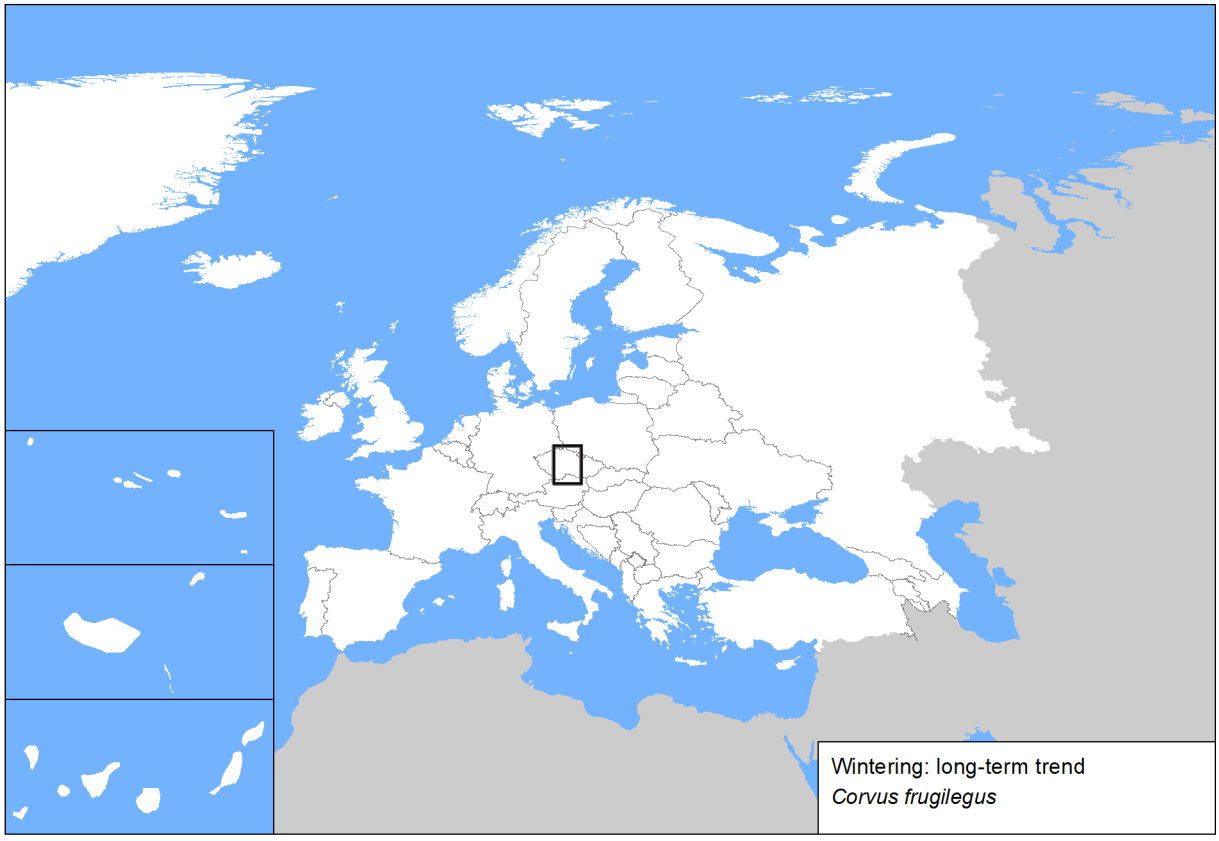



**Figure 4.** Reported wintering population sizes and long-term trends across Europe. Note that some countries within the species' wintering range did not report any data.



# Sources

## Albania

| |
|---|
| **Breeding population size:** Bino & Xeka 2020 in EBBA 2 |
| **Breeding short-term trend:** Bino & Xeka pers. obs. |
| **Breeding long-term trend:** Bino pers. obs. |

## Armenia

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|---|
| **Breeding population size:** TSE NGO National Bird Monitoring data. |
| **Breeding short-term trend:** TSE (2020) The Atlas of the Breeding Birds in Armenia. In preparation. |
| **Breeding long-term trend:** TSE (2020) The Atlas of the Breeding Birds in Armenia. In preparation. |

## Austria

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| **Breeding population size:** Andreas Ranner et al., unpublished data (Burgenland); BirdLife Austria, unpublished data from www.ornitho.at (all other counties) |
| **Breeding short-term trend:** Andreas Ranner et al., unpublished data (Burgenland); BirdLife Austria, unpublished data from www.ornitho.at (all other counties); BirdLife Austria, unpublished archive data |
| **Breeding long-term trend:** Andreas Ranner et al., unpublished data (Burgenland); BirdLife Austria, unpublished data from www.ornitho.at (all other counties); BirdLife Austria, unpublished archive data; Dvorak, Ranner & Berg 1993 (Atlas of Austrian breeding birds 1981-1985) |

## Azerbaijan

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| **Breeding population size:** BirdLife International 2004 |
| **Breeding short-term trend:** AOS data base |
| **Breeding long-term trend:** AOS Data Base |

## Belarus

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| **Breeding population size:** Research work of the National Academy of Sciences of the Republic of Belarus “Dynamics and predictive assessment of changes in the state of populations of the main resource and biocenotically most important bird species in Belarus” |
| **Breeding long-term trend:** Nikiforov M.E., Kozulin A.V., eds. Belarussian birds at the beginning of XXI century: status, numbers, distribution. - 1997. - Minsk. - 187 p. |

## Belgium

| |
|---|
| **Breeding population size:** Vermeersch G. et al. (2018, in press). Broedvogels in Vlaanderen in de periode 2013-2018. Rapporten van het Instituut voor Natuur- en Bosonderzoek (INBO), Brussel. / Paquet, J-Y., Anselin, A., Vermeersch, G., Derouaux, A., Devos, K. (2019, in prep.). Contribution of Belgium to EBCC European Breeding Bird Atlas 2. Internal Report. |
| **Breeding short-term trend:** Vermeersch G. et al. (2018, in press). Broedvogels in Vlaanderen in de periode 2013-2018. Rapporten van het Instituut voor Natuur- en Bosonderzoek (INBO), Brussel. / Paquet, J-Y., Anselin, A., Vermeersch, G., Derouaux, A., Devos, K. (2019, in prep.). Contribution of Belgium to EBCC European Breeding Bird Atlas 2. Internal Report. |
| **Breeding long-term trend:** Vermeersch G. et al. (2018, in press). Broedvogels in Vlaanderen in de periode 2013-2018. Rapporten van het Instituut voor Natuur- en Bosonderzoek (INBO), Brussel. / Paquet, J-Y., Anselin, A., Vermeersch, G., Derouaux, A., Devos, K. (2019, in prep.). Contribution of Belgium to EBCC European Breeding Bird Atlas 2. Internal Report. |

## Bosnia and Herzegovina

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|---|
| **Breeding population size:** Based on data for EBBA2 |
| **Breeding short-term trend:** more individual articles e.g published in magazine Bilten mreže posmatrača ptica u Bosni i Hercegovini-see https://ptice.ba/bs/category/bilteni_/), individual reports (e.g. for EBBA2, projects etc) |
| **Breeding long-term trend:** Svjetoslav Obratil, unpublish data, reports for EBBA2 |

## Bulgaria

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|---|
| **Breeding population size:** expert opinion; National Art. 12 reporting database 2013-2018; Iankov, P. (ed.). 2007. Atlas of Breeding Birds in Bulgaria. BSPB Conservation Series Book 10.; National Art. 12 reporting database 2013-2018; |
| **Breeding short-term trend:** expert opinion; National Art. 12 reporting database 2013-2018; Iankov, P. (ed.). 2007. Atlas of Breeding Birds in Bulgaria. BSPB Conservation Series Book 10.; National Art. 12 reporting database 2013-2018; |
| **Breeding long-term trend:** Iankov P. (ed.) 2007. Atlas of Breeding Birds in Bulgaria. Bulgarian Society for the protection of Birds, Conservation Series, Book 10, Sofia, BSPB, 80-81; Iankov, P. (ed.). 2007. Atlas of Breeding Birds in Bulgaria. BSPB Conservation Series Book 10.; National Art. 12 reporting database 2013-2018; |

## Croatia

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|---|
| **Breeding population size:** Središnja lovna evidencija (https://sle.mps.hr) |
| **Breeding short-term trend:** No data available. |
| **Breeding long-term trend:** No data available. |

## Czechia

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|---|
| **Breeding population size:** Šťastný et Bejček in prep. - Atlas hnízdního rozšíření ptáků ČR 2014-2017 |
| **Breeding short-term trend:** expert opinion |
| **Breeding long-term trend:** expert opinion |

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## Czechia

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| **Winter population size:** expert opinion |
| **Winter short-term trend:** expert opinion |
| **Winter long-term trend:** expert opinion |

## Denmark

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| **Breeding population size:** Charlotte M. Moshøj, Daniel Palm Eskildsen, Michael Fink Jørgensen & Thomas Vikstrøm, (2018): Overvågning af de almindelige fuglearter i Danmark 1975-2017 & Mandrup, E. 1997, Hvor mange fugle yngler i Danmark, Dansk Ornitologisk Tidsskrift, nr 3, 1997 |
| **Breeding short-term trend:** Charlotte M. Moshøj, Daniel Palm Eskildsen, Michael Fink Jørgensen & Thomas Vikstrøm, (2018): Overvågning af de almindelige fuglearter i Danmark 1975-2017 |
| **Breeding long-term trend:** Charlotte M. Moshøj, Daniel Palm Eskildsen, Michael Fink Jørgensen & Thomas Vikstrøm, (2018): Overvågning af de almindelige fuglearter i Danmark 1975-2017 |

## Estonia

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|---|
| **Breeding population size:** Estonian Working Group on Bird Status and Numbers |
| **Breeding short-term trend:** [1] Estonian Working Group on Bird Status and Numbers [2] Point counts of breeding birds. http://seire.keskkonnainfo.ee/index.php?option=com_content&view=article&id=3417&Itemid=5815 |
| **Breeding long-term trend:** [1] Estonian Working Group on Bird Status and Numbers [2] Point counts of breeding birds. http://seire.keskkonnainfo.ee/index.php?option=com_content&view=article&id=3417&Itemid=5815 |

## Finland

| |
|---|
| **Breeding population size:** Lehikoinen, A. , Below, A., Jukarainen, A., Laaksonen, T., Lehtiniemi, T., Mikkola-Roos, M., Pessa, J., Rajasärkkä, A., Rusanen, P., Sirkiä, P., Tiainen, J. & Valkama, J. 2019: Suomen lintujen pesimäkantojen koot. – Linnut-vuosikirja 2018: 38-45. |
| **Breeding short-term trend:** BirdLife Finland 219: Regional observation summary database of Finnish Birdwatching societies on scarce bird species. Birdlife Finland: Tiira-bird observation database |
| **Breeding long-term trend:** Rytkönen, S., Koivula, K. & Lindgren, E. 1990: Mustavarisyhdyskuntien ekologia Oulun seudulla. - Selvitys nro 78. Ympäristöministeriö, Helsinki. 52 s. (in Finnish). BirdLife Finland 2019: Regional observation summary database of Finnish Birdwatching societies on scarce bird species. Birdlife Finland: Tiira-bird observation database. |

## France

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|---|
| **Breeding short-term trend:** . STOC EPS / MNHN. ; Onkelinx, T., Devos, K., & Quataert, P. 2017. Working with population totals in the presence of missing data comparing imputation methods in terms of bias and precision. Journal of Ornithology, 158(2), 603-615 ; Onkelinx, T., Devos, K., Jansen, I., Van Calster, H., & Quataert, P. 2017. Reply to the comment on 'Working with population totals in the presence of missing data comparing imputation methods in terms of bias and precision'by Bogaart et al. Journal of Ornithology, |

## Georgia

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| **Breeding population size:** EBBA Georgia, prepared by Sabuko-Society for nature conservation, Ilia state university, NGO "psovi". |

## Germany

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|---|
| **Breeding population size:** Monitoring seltener Brutvögel (http://www.dda-web.de/index.php?cat=monitoring&subcat=ga&subsubcat=kontakt) |
| **Breeding short-term trend:** Gerlach et al. (in Vorb.): Vögel in Deutschland – 2019. Dachverband Deutscher Avifaunisten, Bundesamt für Naturschutz und Länderarbeitsgemeinschaft der Vogelschutzwarten, Münster. |
| **Breeding long-term trend:** Gerlach et al. (in Vorb.): Vögel in Deutschland – 2019. Dachverband Deutscher Avifaunisten, Bundesamt für Naturschutz und Länderarbeitsgemeinschaft der Vogelschutzwarten, Münster. |

## Greece

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|---|
| **Breeding population size:** 1) BirdLife International (2004) Birds in Europe:Population estimates, trends and conservation status. Cambridge, UK: Birdlife International (Birdlife Conservation Series No. 12). 2) Natura Viewer (http://natura2000.eea.europa.eu/#). |
| **Breeding short-term trend:** 1) BirdLife International (2004) Birds in Europe:Population estimates, trends and conservation status. Cambridge, UK: Birdlife International (Birdlife Conservation Series No. 12). 2) Natura Viewer (http://natura2000.eea.europa.eu/#). |
| **Breeding long-term trend:** No data available |

## Hungary

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|---|
| **Breeding population size:** National park directorates' databases (Annual survey of colonially breeding and strictly protected bird species) http://map.mme.hu/maps/map2 |
| **Breeding short-term trend:** National park directorates' databases (Annual survey of colonially breeding and strictly protected bird species) http://map.mme.hu/maps/map2 |
| **Breeding long-term trend:** Kalotás Zs. (1984): A vetési varjú (Corvus frugilegus) állományfelmérése Magyarországon 1980 tavaszán. Puszta 2/11.: 109-121. p. National park directorates' databases (Annual survey of colonially breeding and strictly protected bird species) http://map.mme.hu/maps/map2 |

## Republic of Ireland

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|---|
| **Breeding population size:** Lewis, L. J., Coombes, D., Burke, B., O'Halloran, J., Walsh, A., Tierney, T. D. & Cummins, S. (2019) Countryside Bird Survey: Status and trends of common and widespread breeding birds 1998-2016. Irish Wildlife Manuals (in prep). National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland. |
| **Breeding short-term trend:** Lewis, L. J., Coombes, D., Burke, B., O'Halloran, J., Walsh, A., Tierney, T. D. & Cummins, S. (2019) Countryside Bird Survey: Status and trends of common and widespread breeding birds 1998-2016. Irish Wildlife Manuals (in prep). National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland. |

## Republic of Ireland

**Breeding long-term trend:** Lewis, L. J., Coombes, D., Burke, B., O'Halloran, J., Walsh, A., Tierney, T. D. & Cummins, S. (2019) Countryside Bird Survey: Status and trends of common and widespread breeding birds 1998-2016. Irish Wildlife Manuals (in prep). National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland.

## Kosovo

**Breeding population size:** Qenan Maxhuni

**Breeding short-term trend:** Qenan Maxhuni

**Breeding long-term trend:** Puzovic, S. et al. (2004): Birds of Serbia and Montenegro – Size of nesting populations. I trends: 1990-2002. Ciconia 12

## Latvia

**Breeding population size:** Unpublished data for European Breeding Bird Atlas (2013-2017); Expert: Andris Dekants, andris.dekants@lob.lv

**Breeding short-term trend:** Unpublished data for European Breeding Bird Atlas (2013-2017); Expert: Andris Dekants, andris.dekants@lob.lv

**Breeding long-term trend:** Priednieks J., Strazds M., Strazds A., Petrins A. 1989. Latvian Breeding Bird Atlas 1980-1984. Riga: Zinatne Unpublished data for European Breeding Bird Atlas (2013-2017); Expert: Andris Dekants, andris.dekants@lob.lv

## Lithuania

**Breeding population size:** Expert working group of the Lithuanian Ornithological Society (lod@birdlife.lt) 2015-2018. Lietuvos perinčių paukščių atlaso duomenų bazė (Lithuanian Breeding Birds Atlas Database). Vilnius. Ministry of Environment of the Republic of Lithuania. 2012. Status and trends of bird populations (Article 12, Birds Directive 2009/147/EC) National Summary 2008-2012 Lithuania. Ministry of Environment of the Republic of Lithuania. 2016-2018. Leidinio "Lietuvos raudonoji knyga" parengimo paslaugos (Red data book of Lithuania). (Agreement No VPS-2016-104-ES) Ministry of Environment of the Republic of Lithuania. 2017-2018. Lietuvos saugomų gyvūnų, augalų ir grybų vertinimo pagal IUCN kategorijas ir rūšių aprašymų parengimo paslaugos (Protected species of animals, plants and mushrooms IUCN status estimation and describtions in Lithuania (Agreement No VPS-2017-16-AARP)

**Breeding short-term trend:** Expert working group of the Lithuanian Ornithological Society (lod@birdlife.lt) 2015-2018. Lietuvos perinčių paukščių atlaso duomenų bazė (Lithuanian Breeding Birds Atlas Database). Vilnius. Ministry of Environment of the Republic of Lithuania. 2012. Status and trends of bird populations (Article 12, Birds Directive 2009/147/EC) National Summary 2008-2012 Lithuania. Ministry of Environment of the Republic of Lithuania. 2016-2018. Leidinio "Lietuvos raudonoji knyga" parengimo paslaugos (Red data book of Lithuania). (Agreement No VPS-2016-104-ES) Ministry of Environment of the Republic of Lithuania. 2017-2018. Lietuvos saugomų gyvūnų, augalų ir grybų vertinimo pagal IUCN kategorijas ir rūšių aprašymų parengimo paslaugos (Protected species of animals, plants and mushrooms IUCN status estimation and describtions in Lithuania (Agreement No VPS-2017-16-AARP)

**Breeding long-term trend:** Logminas, V. (ed.). 1991. Lietuvos fauna: paukščiai. Vilnius: „Mokslas". Kurlavičius, P. (ed.) 2006. Lietuvos perinčių paukščių atlasas. Kaunas: „Lututė". Expert working group of the Lithuanian Ornithological Society (lod@birdlife.lt) BirdLife International/European Bird Cencus Council. 2000. European bird populations: estimates and trends. Cambridge, UK: BirdLife International (BirdLife Conservation Series No. 10). Raudonikis L. 2004. Important Bird Areas of the European Union Importance in Lithuania. Lithuanian Ornithological Society & Institute of Ecology of Vilnius University. Lutute, Vilnius. Jusys, V., Karalius, S., Raudonikis, L. 2012. Lietuvos paukščių pažinimo vadovas. Kaunas: „Lututė". Ministry of Environment of the Republic of Lithuania. 2012. Status and trends of bird populations (Article 12, Birds Directive 2009/147/EC) National Summary 2008-2012 Lithuania. Expert working group of the Lithuanian Ornithological Society (lod@birdlife.lt) 2015-2018. Lietuvos perinčių paukščių atlaso duomenų bazė (Lithuanian Breeding Birds Atlas Database). Vilnius. Ministry of Environment of the Republic of Lithuania. 2016-2018. Leidinio "Lietuvos raudonoji knyga" parengimo paslaugos (Red data book of Lithuania). (Agreement No VPS-2016-104-ES) Ministry of Environment of the Republic of Lithuania. 2017-2018. Lietuvos saugomų gyvūnų, augalų ir grybų vertinimo pagal IUCN kategorijas ir rūšių aprašymų parengimo paslaugos (Protected species of animals, plants and mushrooms IUCN status estimation and describtions in Lithuania (Agreement No VPS-2017-16-AARP)

## Luxembourg

**Breeding population size:** Biver G. (2009): Die Saatkrähe Corvus frugilegus in Luxemburg 2008. Regulus Wissenschaftliche Berichte, 24: 33-39; Biver G., F. Muller (2011): Le Corbeau freux à Luxembourg-Ville. Regulus 8/2011: 10-11; Ornitho.lu (2018): online database natur&ëmwelt asbl & Dachverband Deutscher Avifaunisten (DDA) e.V.; Luxembourg Recorder (2018): database Musée national d'histoire naturelle; Luxembourg Lorgé P., E. Melchior (2016): Die Vögel Luxemburgs. Natur&ëmwelt Luxembourg. ISBN: 978-2-919920-01-3

**Breeding short-term trend:** Biver G. (2009): Die Saatkrähe Corvus frugilegus in Luxemburg 2008. Regulus Wissenschaftliche Berichte, 24: 33-39; Biver G., F. Muller (2011): Le Corbeau freux à Luxembourg-Ville. Regulus 8/2011: 10-11; Ornitho.lu (2018): online database natur&ëmwelt asbl & Dachverband Deutscher Avifaunisten (DDA) e.V.; Luxembourg Recorder (2018): database Musée national d'histoire naturelle; Luxembourg Lorgé P., E. Melchior (2016): Die Vögel Luxemburgs. Natur&ëmwelt Luxembourg. ISBN: 978-2-919920-01-3; LUXOR (2018): natur&ëmwelt – Bird-database, Luxembourg

**Breeding long-term trend:** Biver G. (2009): Die Saatkrähe Corvus frugilegus in Luxemburg 2008. Regulus Wissenschaftliche Berichte, 24: 33-39; Biver G., F. Muller (2011): Le Corbeau freux à Luxembourg-Ville. Regulus 8/2011: 10-11; Ornitho.lu (2018): online database natur&ëmwelt asbl & Dachverband Deutscher Avifaunisten (DDA) e.V.; Luxembourg Recorder (2018): database Musée national d'histoire naturelle; Luxembourg Lorgé P., E. Melchior (2016): Die Vögel Luxemburgs. Natur&ëmwelt Luxembourg. ISBN: 978-2-919920-01-3; LUXOR (2018): natur&ëmwelt – Bird-database, Luxembourg; Melchior E., E. Mentgen, R. Peltzer, R. Schmitt, J. Weiss (1987): Atlas der Brutvögel Luxemburgs. Lëtzebuerger Natur- a Vulleschutzliga. Kremer-Muller & Cie, Foetz, Luxembourg

## North Macedonia

**Breeding population size:** unpublished data from the European Breeding Bird Atlas 2

**Breeding short-term trend:** unpublished data from the European Breeding Bird Atlas 2

## Moldova

**Breeding population size:** Moldova`s contribution for the second European Breeding Bird Atlas (EBBA2)

**Breeding short-term trend:** SPPN expert opinion (sppn.moldova@gmail.com)

**Breeding long-term trend:** SPPN expert opinion (sppn.moldova@gmail.com)

## Netherlands

**Breeding population size:** Sovon NEM (Sovon, CBS and provincies) and Bird atlas (Sovon 2018)

**Breeding short-term trend:** NEM (Sovon, RWS, CBS, provincies)

**Breeding long-term trend:** Sovon

## Norway

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| **Breeding population size:** (a) Shimmings P. & Øien, I.J. 2015. Bestandsestimater og trender for norske hekkefugler. NOF-rapport 2015-2. (b) Tøråsen, A. 2017. Kornkråka i Hedmark 2017. 47: 78. (c) Artsobservasjoner.no www.artsobservasjoner.no |
| **Breeding long-term trend:** Shimmings P. & Øien, I.J. 2015. Bestandsestimater og trender for norske hekkefugler. NOF-rapport 2015-2. |

## Poland

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| **Breeding population size:** State Environmental Monitoring / Chief Inspectorate of Environmental Protection (survey: MFGP – Flagship Species Survey) |
| **Breeding short-term trend:** State Environmental Monitoring / Chief Inspectorate of Environmental Protection (survey: MFGP) |
| **Breeding long-term trend:** Chief Inspectorate of Environmental Protection & Polish Society for the Protection of Birds (OTOP) / BirdLife Poland |

## Romania

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| **Breeding population size:** Ornitodata (Romanian Ornithological Society) Database, OpenBirdMaps (Milvus Group) Database, Rombird (Romanian Rarity Commission) Database |
| **Breeding short-term trend:** Romanian Common Bird Monitoring Programme, Ornitodata (Romanian Ornithological Society) Database, OpenBirdMaps (Milvus Group) Database |
| **Breeding long-term trend:** Ornitodata (Romanian Ornithological Society) Database, OpenBirdMaps (Milvus Group) Database, Rombird (Romanian Rarity Commission) Database |

## Russia

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| **Breeding population size:** Voltzit & Kalyakin 2013-2019; Database of the project on Atlas of breeding birds of European Russia |
| **Breeding short-term trend:** Belik, unpublished. vpbelik@mail.ru; Sarychev, unpublished. vssar@yandex.ru; Korotkova et al. 2017 |
| **Breeding long-term trend:** Belik 2003; Belik et al. 2003; Sarychev 2009; Shepel, unpublished†; Baranovsky & Ivanov 2017 |

## Serbia

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| **Breeding population size:** EBBA2 project; Puzović, S., Radišić, D., Ružić, M., Rajković, D., Radaković, M., Pantović, U., Janković, M., Stojnić, N., Šćiban, M., Tucakov, M., Gergelj, J., Sekulić, G., Agošton, A. & Raković, M. 2015. Birds of Serbia: Breeding Population Estimates and Trends for the Period 2008-2013. Bird protection and study society of Serbia, and Department of Biology and Ecology, Faculty of Sciences, University of Novi Sad, Novi Sad. |
| **Breeding short-term trend:** Puzović, S., Radišić, D., Ružić, M., Rajković, D., Radaković, M., Pantović, U., Janković, M., Stojnić, N., Šćiban, M., Tucakov, M., Gergelj, J., Sekulić, G., Agošton, A. & Raković, M. 2015. Birds of Serbia: Breeding Population Estimates and Trends for the Period 2008-2013. Bird protection and study society of Serbia, and Department of Biology and Ecology, Faculty of Sciences, University of Novi Sad, Novi Sad. |
| **Breeding long-term trend:** Puzović, S., Radišić, D., Ružić, M., Rajković, D., Radaković, M., Pantović, U., Janković, M., Stojnić, N., Šćiban, M., Tucakov, M., Gergelj, J., Sekulić, G., Agošton, A. & Raković, M. 2015. Birds of Serbia: Breeding Population Estimates and Trends for the Period 2008-2013. Bird protection and study society of Serbia, and Department of Biology and Ecology, Faculty of Sciences, University of Novi Sad, Novi Sad. |

## Slovakia

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| **Breeding population size:** Coordinatory group for reporting 2019. Danko Štefan, Darolová Alžbeta, Krištín Anton: Rozšírenie vtákov na Slovensku. VEDA, vyd. SAV Bratislava, 2002. |
| **Breeding short-term trend:** Coordinatory group for reporting 2019, AVES-Symfony Database 2013-2018, KIMS Database 2013-2018. Danko Štefan, Darolová Alžbeta, Krištín Anton: Rozšírenie vtákov na Slovensku. VEDA, vyd. SAV Bratislava, 2002. |
| **Breeding long-term trend:** Coordinatory group for reporting 2019, AVES-Symfony Database 2013-2018, KIMS Database 2013-2018. Danko Štefan, Darolová Alžbeta, Krištín Anton: Rozšírenie vtákov na Slovensku. VEDA, vyd. SAV Bratislava, 2002. |

## Slovenia

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| **Breeding population size:** MIHELIČ T., KMECL P., DENAC K., KOCE U., VREZEC A., DENAC D. (eds.) (2019): Atlas ptic Slovenije. Popis gnezdilk 2002–2017. – DOPPS, Ljubljana. |
| **Breeding short-term trend:** MIHELIČ T., KMECL P., DENAC K., KOCE U., VREZEC A., DENAC D. (eds.) (2019): Atlas ptic Slovenije. Popis gnezdilk 2002–2017. – DOPPS, Ljubljana. |
| **Breeding long-term trend:** There are no sources for this information. |

## Spain

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| **Breeding population size:** García Fernández, J. (2012). La graja en España. Población reproductora en 2011 y método de censo. SEO/BirdLife. Madrid. 38 pp. (https://www.miteco.gob.es/fr/biodiversidad/temas/inventarios-nacionales/37-%20Graja_tcm36-208185.pdf) Purroy, J. & Purroy, F.J. (2016). Graja – Corvus frugilegus. En: Enciclopedia Virtual de los Vertebrados Españoles. Salvador, A., Morales, M. B. (Eds.). Museo Nacional de Ciencias Naturales, Madrid. (http://www.vertebradosibericos.org/aves/corfru.html) |
| **Breeding short-term trend:** García Fernández, J. (2012). La graja en España. Población reproductora en 2011 y método de censo. SEO/BirdLife. Madrid. 38 pp. (https://www.miteco.gob.es/fr/biodiversidad/temas/inventarios-nacionales/37-%20Graja_tcm36-208185.pdf) Purroy, J., Purroy, F.J. (2016). Graja – Corvus frugilegus. En: Enciclopedia Virtual de los Vertebrados Españoles. Salvador, A., Morales, M. B. (Eds.). Museo Nacional de Ciencias Naturales, Madrid. (http://www.vertebradosibericos.org/aves/corfru.html) SEO/BirdLife (2012). Resultados del programa Sacre de SEO/BirdLife en 2011. SEO/BirdLife. Madrid. |
| **Breeding long-term trend:** García Fernández, J. (2012). La graja en España. Población reproductora en 2011 y método de censo. SEO/BirdLife. Madrid. 38 pp. (https://www.miteco.gob.es/fr/biodiversidad/temas/inventarios-nacionales/37-%20Graja_tcm36-208185.pdf) Purroy, J., Purroy, F.J. (2016). Graja – Corvus frugilegus. En: Enciclopedia Virtual de los Vertebrados Españoles. Salvador, A., Morales, M. B. (Eds.). Museo Nacional de Ciencias Naturales, Madrid. (http://www.vertebradosibericos.org/aves/corfru.html) SEO/BirdLife (2012). Resultados del programa Sacre de SEO/BirdLife en 2011. SEO/BirdLife. Madrid. |

## Sweden

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| **Breeding population size:** Ottosson, U., Ottvall, R., Elmberg, J., Green, M., Gustafsson, R., Haas, F., Holmqvist, N., Lindström, Å., Nilsson, L., Svensson, M., Svensson, S. & Tjernberg, M. 2012. Fåglarna i Sverige – antal och förekomst. SOF, Halmstad. Swedish Bird Survey. BirdLife Sverige, Annual Bird reports. |
| **Breeding short-term trend:** Svensk fågeltaxering - Swedish Bird Survey |

## Sweden

**Breeding long-term trend:** Expert judgement based on regional inventories

## Switzerland

**Breeding population size:** Knaus, P., S. Antoniazza, S. Wechsler, J. Guélat, M. Kéry, N. Strebel & T. Sattler (2018): Swiss Breeding Bird Atlas 2013–2016. Distribution and population trends of birds in Switzerland and Liechtenstein. Swiss Ornithological Institute, Sempach.

**Breeding short-term trend:** https://www.vogelwarte.ch/en/projects/population-trends/breeding-population-indices/

**Breeding long-term trend:** https://www.vogelwarte.ch/en/projects/population-trends/breeding-population-indices/

## Turkey

**Breeding population size:** Murat Bozdoğan, Ferdi Akarsu, Güven Eken personal communication (2019), Birdlife International (2004) Birds in Europe: population estimates, trends and conservation status, Cambridge UK: Birdlife International (Birdlife Conservation series no: 12) Kusbank Bird Database (Ebird) Kirwan G.M., Boyla K. A., Castell P., Demirci B., Özen M., Welch H., Marlow T., 2008, Birds of Turkey. Londra, Christopher Helm, 978-1-4081-0475-

## Ukraine

**Breeding population size:** Atlas work, non-published data

## United Kingdom

**Breeding population size:** Baseline = Marchant, J.H., & Gregory, R.D. 1999. Numbers of nesting Rooks Corvus frugilegus in the United Kingdom in 1996. Bird Study 46: 258-273. Extrapolation from 2006 using Breeding Bird Survey monitoring trend.

**Breeding short-term trend:** BTO/JNCC/RSPB Breeding Bird Survey data: Harris, S.J., Massimino, D., Gillings, S., Eaton, M.A., Noble, D.G., Balmer, D.E., Procter, D., PearceHiggins, J.W. & Woodcock, P. 2018. The Breeding Bird Survey 2017. BTO Research Report 706 British Trust for Ornithology, Thetford. https://www.bto.org/sites/default/files/bbs-report-2017.pdf

**Breeding long-term trend:** BTO/JNCC/RSPB Breeding Bird Survey data: Harris, S.J., Massimino, D., Gillings, S., Eaton, M.A., Noble, D.G., Balmer, D.E., Procter, D., PearceHiggins, J.W. & Woodcock, P. 2018. The Breeding Bird Survey 2017. BTO Research Report 706 British Trust for Ornithology, Thetford. https://www.bto.org/sites/default/files/bbs-report-2017.pdf

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