

***Branta leucopsis* (Barnacle Goose)**

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).

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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.

Branta leucopsis (Barnacle Goose)

Table 1. Reported national breeding population size and trends in Europe¹.

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	
Czechia	2–4	<1	2014-2017	complete	+		2002-2016	complete	+		1986-2016	complete	Russia/Germany & Netherlands
Denmark	4500–4600	1	2015-2015	complete	+		2006-2017	complete	+		1980-2017	complete	Russia/Germany & Netherlands
DK: Greenland	18000	4	2018	complete	+		2007-2018	complete	+		1989-2018	complete	Greenland flyway population
Estonia	80–100	<1	2013-2017	complete	0	20 to 37	2006-2017	complete	+	90 to 302	1980-2017	complete	Russia/Germany & Netherlands
Finland	6000–8000	2	2013-2018	partial	+		2007-2018	complete	+		1981-2018	partial	Russia/Germany & Netherlands
Germany	750–800	<1	2012-2016	complete	+	186 to 384	2004-2016	complete	+		1985-2016	expert	Russia/Germany & Netherlands
Iceland	2100	<1	2019	complete	+		2009-2019	complete	+		1980-2019	complete	East Greenland/Scotland & Ireland
Netherlands	16000–22000	4	2013-2015	complete	+	137 to 208	2006-2017	complete	+	1599900 to 2199900	1984-2017	partial	Russia/Germany & Netherlands
NO: Svalbard	10000–15000	3	2018	complete	+		2013-2018	complete	+	350 to 400	1980-2018	complete	
Russia	300000–470000	85	2010-2018	partial	+	0	2010-2018	partial	+	0	1980-2018	partial	
Sweden	2400–3400	<1	2013-2018	partial	-	-50 to -30	2007-2018	partial	+	1500 to 2500	1980-2018	partial	Russia/Germany & Netherlands
United Kingdom	1500–1600	100	2012-2016	complete	+		2005-2016	complete	+		1980-2016	complete	non-native populations
EU28	29700–38900	8											
Europe	359000–544000	100											
Europe	1500–1600	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.

Branta leucopsis (Barnacle Goose)

Table 2. Reported national wintering population sizes and trends in Europe¹. 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	
Belgium	7100–14000	<1	2013-2018	complete	+	103 to 464	2007-2018	complete	+	6233 to 28076	1992-2018	complete	
Czechia	1–3	<1	2015-2019	complete	?		2008-2019	complete	?		1980-2019	complete	
Denmark	164000–165000	12	2017-2017	complete	+		2006-2017	complete	+		1981-2017	complete	
Germany	355000	25	2011-2016	complete	+	90 to 123	2003-2016	complete	+	-1877 to -3194	1980-2016	complete	
Rep. Ireland	16200–16300	1	2018	complete	+		2008-2018	complete	+		1987-2018	complete	
Netherlands	668000–813000	52	2013-2017	complete	+	72 to 120	2006-2017	complete	+	1186 to 1541	1981-2017	complete	
Poland	200–500	<1	2013-2018	partial	?	-87 to 292	2013-2018	complete	+	20000 to 50000	1980-2018	expert	
Spain	9–27	<1	2013-2018	complete	?	-10 to 10	2007-2018	complete	?	-10 to 10	1980-2018	complete	
Sweden	6000–50000	2	2013-2018	complete	+	500 to 700	2007-2018	complete	+	350000 to 500000	1980-2018	complete	
United Kingdom	55900–56000	4	2017	complete	+		2003-2017	complete	+		1978-2017	complete	
United Kingdom	41700	3	2016	complete	+		2005-2016	complete	+		1980-2016	complete	
EU28	1310000–1520000	100											
Europe	1310000–1520000	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>.

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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 ($\geq 50\%$) | ↓ Large decrease ($\geq 50\%$) |
| ↑ Moderate increase (20–49%) | ↓ Moderate decrease (20–49%) |
| ↑ Small increase ($< 20\%$) | ↓ Small decrease ($< 20\%$) |
| ↑ Increase of unknown magnitude | ↓ 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: $\geq 10\%$ of the European population
- ↑ Medium: 1–9% of the European population
- ↑ Small: $< 1\%$ of the European population

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THE IUCN RED LIST OF THREATENED SPECIES™

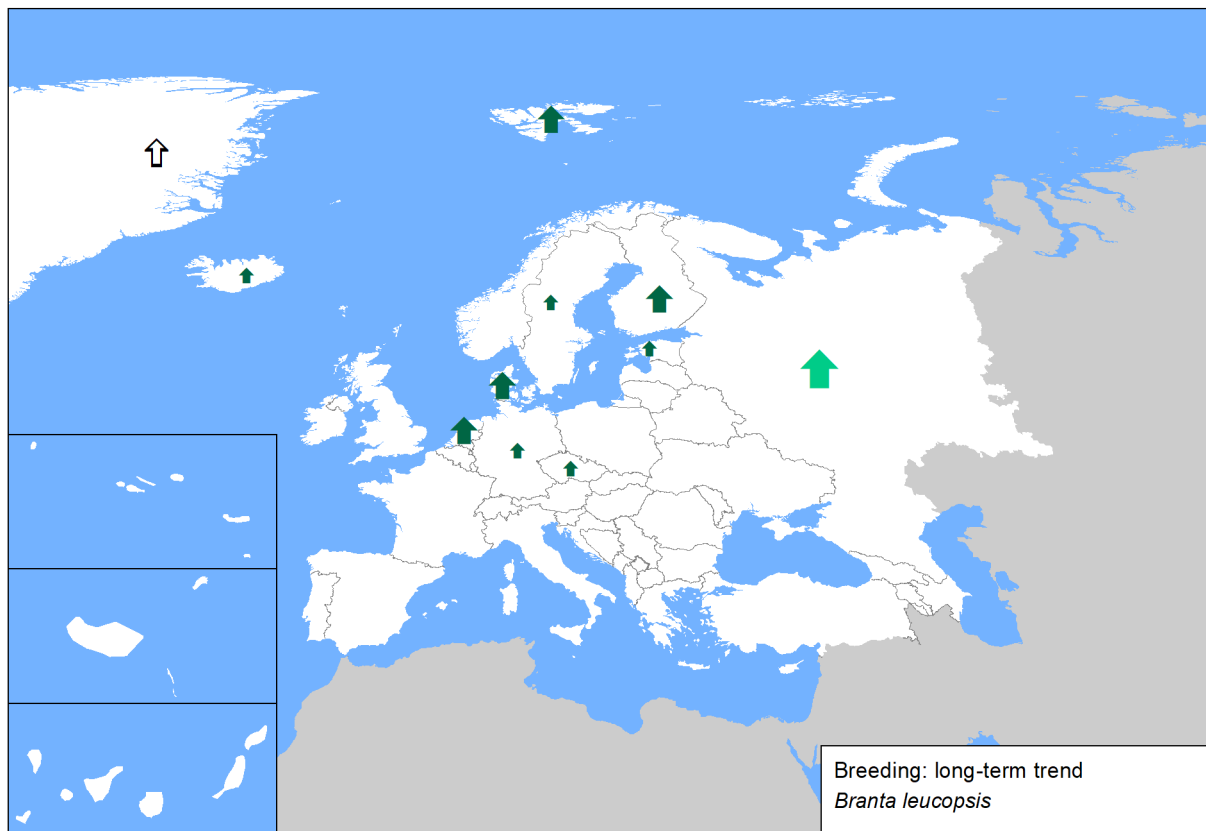


Figure 3. Reported wintering population sizes and short-term trends across Europe. Note that some countries within the species' wintering range did not report any data.

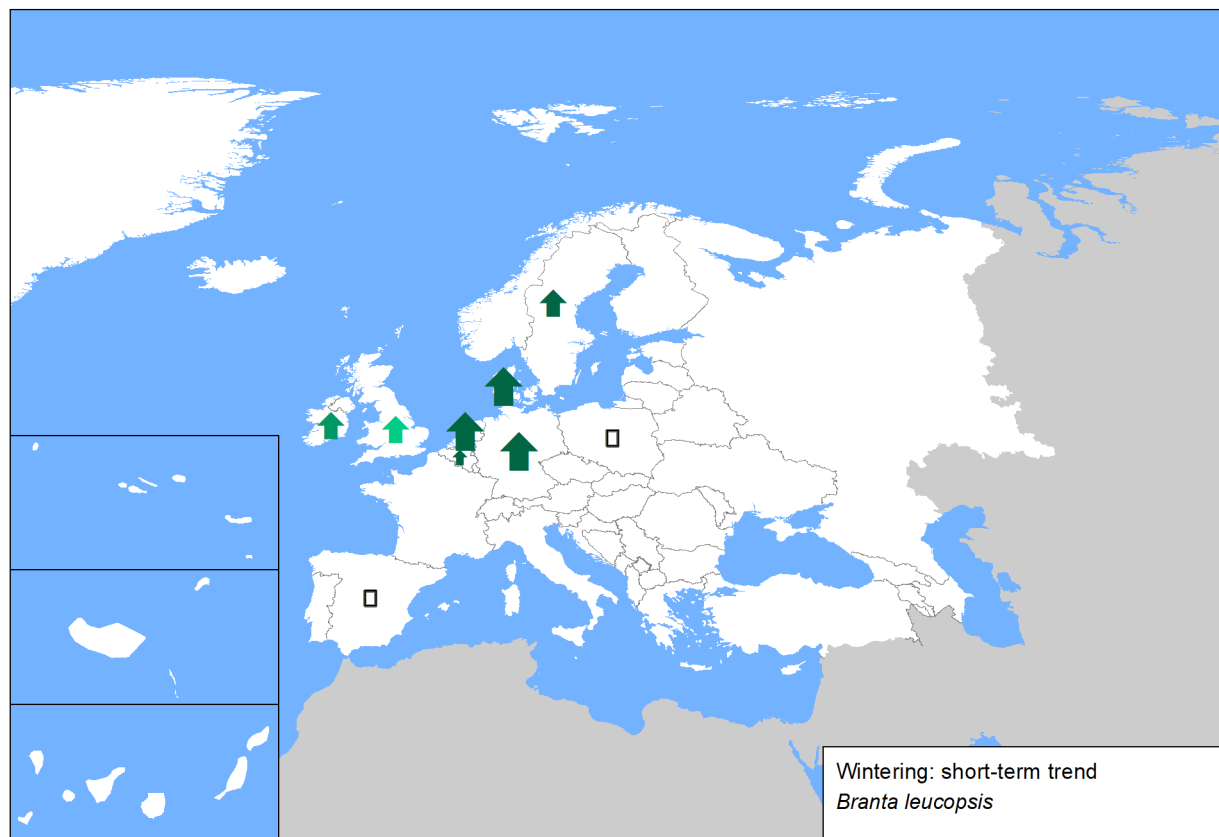
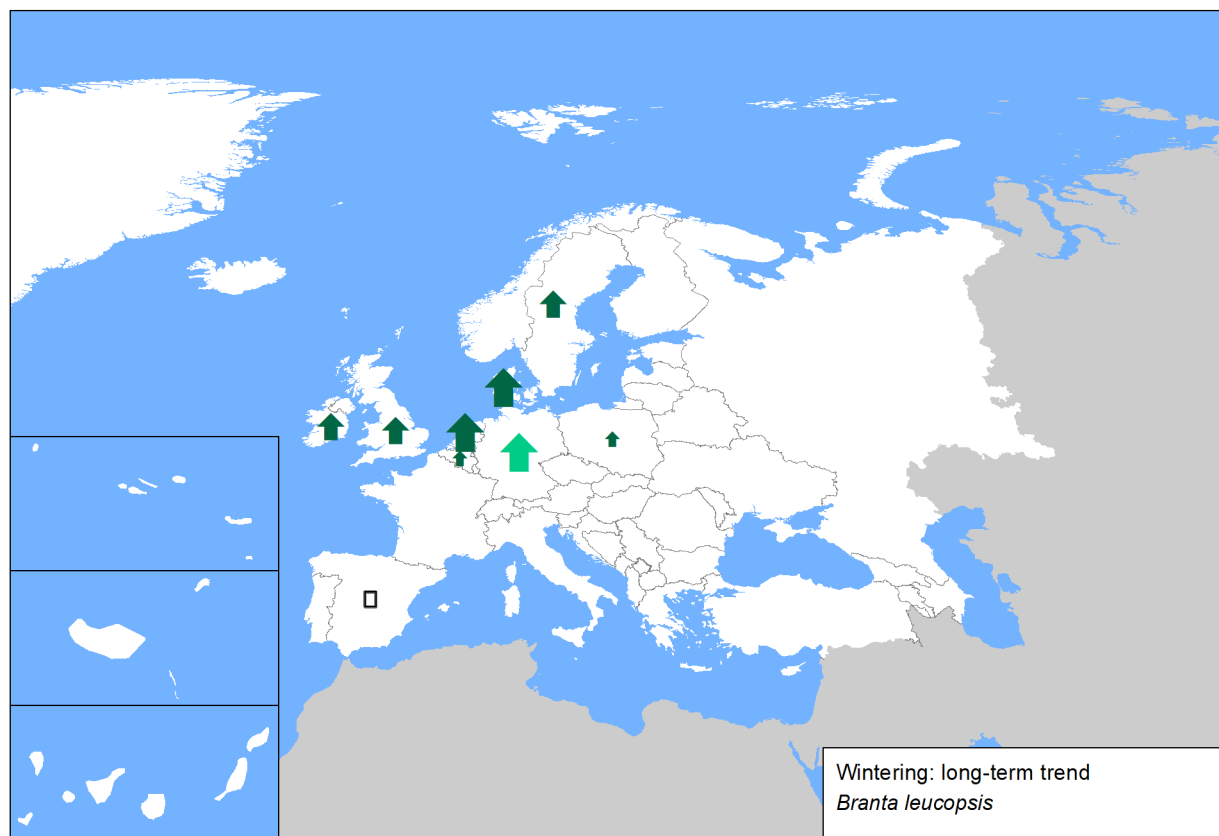


Figure 4. Reported wintering population sizes and long-term trends across Europe. Note that some countries within the species' wintering range did not report any data.



Sources

Belgium: Russia/Germany & Netherlands

Winter population size: Waterbird database INBO
Winter short-term trend: Waterbird database INBO & Aves
Winter long-term trend: Waterbird database INBO & Aves

Czechia: Russia/Germany & Netherlands

Breeding population size: Šťastný et Bejček in prep. - Atlas hnízdního rozšíření ptáků ČR 2014-2017
Breeding short-term trend: Šťastný et Bejček in prep. - Atlas hnízdního rozšíření ptáků ČR 2014-2017
Breeding long-term trend: Šťastný et al. 2006

Czechia: non-native populations

Winter population size: Waterbird numbers were recorded in mid-January by regular citizen-science monitoring programme - the International Waterbird Census (IWC) – see Gilissen et al. 2002, Wetlands International 2006, Wetlands International 2019. Hundreds of volunteer birdwatchers conduct the mid-January counts on predetermined dates and sites each year, aiming to maximize synchrony (Gilissen et al. 2002, Musil et al. 2011, Musilová et al. 2014). The estimation of population size was calculated by Trends and Indices for Monitoring data (TRIM) software (Statistics Netherlands version 3.52, Pannekoek and Van Strien, 2005). 'Time Totals' values of the data (i.e. the actual count values plus the numbers of birds estimated by the TRIM software) for all 1155 sites included in the analysis were used to generate total estimates of the range of numbers of the waterbird species wintering in the Czech Republic between 2015 and 2019. We use the range (min–max) of population estimates due to the effect of between-year variation in numbers because of variable climatic conditions (Musil et al. 2008, Musilová et al. 2018). Gilissen N, Haanstra L, Delany S, Boere G, Hagemeyer W (2002) Numbers and distribution of wintering waterbirds in the Western Palearctic and Southwest Asia in 1987, 1988 and 1999. Results from the International Waterbird Census. Wetlands International Global Series No. 11, Wetlands International, Wageningen, The Netherlands. Musil P, Darolová A, Jureček J, Musilová Z, Podhrázký M, Slabeyová K (2008) The long-term trends in numbers of wintering geese in the Czech Republic and Slovakia in 1991–2007. Tichodroma 20: 61–67. Musil P, Musilová Z, Fuchs R, Poláková S (2011) Long-term changes in numbers and distribution of wintering waterbirds in the Czech Republic, 1966–2008. Bird Study 58: 450–460. Musilová Z, Musil P, Zouhar J, Adam M (2018) Changes in habitat suitability influence non-breeding distribution of waterbirds in central Europe. Ibis: 160: 582–596. Musilová Z, Musil P, Zouhar J, Bejček V, Šťastný K, Hudec K (2014) Numbers of wintering waterbirds in the Czech Republic: long-term and spatial-scale approaches to assess population size. Bird Study 61: 321–331.
Winter short-term trend: completeSurvey
Winter long-term trend: Waterbird numbers were recorded in mid-January by regular citizen-science monitoring programme - the International Waterbird Census (IWC) – see Gilissen et al. 2002, Wetlands International 2006, Wetlands International 2019. Hundreds of volunteer birdwatchers conduct the mid-January counts on predetermined dates and sites each year, aiming to maximize synchrony (Gilissen et al. 2002, Musil et al. 2011, Musilová et al. 2014). The individual species trends in numbers was calculated by Trends and Indices for Monitoring data (TRIM) software (Statistics Netherlands version 3.52, Pannekoek and Van Strien, 2005). The additive slope (i.e. the change in indices from one year to the next) was used to estimate the Czech trend, see also Fouque et al. (2009), Musil et al. (2011), Musilová et al. (2015), Musilová et al. (2018 a, b). Fouque C, Guillemain M, Schricke V (2009) Trends in the numbers of Coot Fulica atra and wildfowl Anatidae wintering in France and their relationship with hunting activity at wetland sites. Wildfowl. Special Issue 2: 42–59. Gilissen N, Haanstra L, Delany S, Boere G, Hagemeyer W (2002) Numbers and distribution of wintering waterbirds in the Western Palearctic and Southwest Asia in 1987, 1988 and 1999. Results from the International Waterbird Census. Wetlands International Global Series No. 11, Wetlands International, Wageningen, The Netherlands. Musil P, Musilová Z, Fuchs R, Poláková S (2011) Long-term changes in numbers and distribution of wintering waterbirds in the Czech Republic, 1966–2008. Bird Study 58: 450–460. Musilová Z, Musil P, Zouhar J, Adam M (2018a) Changes in habitat suitability influence non-breeding distribution of waterbirds in central Europe. Ibis: 160: 582–596. Musilová Z, Musil P, Zouhar J, Adam M, Bejček V (2018b) Importance of Natura 2000 sites for wintering waterbirds: Low preference, species' distribution changes and carrying capacity of Natura 2000 could fail to protect the species. Biological Conservation 228: 79–88. Musilová Z, Musil P, Zouhar J, Bejček V, Šťastný K, Hudec K (2014) Numbers of wintering waterbirds in the Czech Republic: long-term and spatial-scale approaches to assess population size. Bird Study 61: 321–331. Musilová Z, Musil P, Zouhar J, Romportl D (2015) Long-term trends, total numbers and species richness of increasing waterbird populations at sites on the edge of their winter range: cold-weather refuge sites are more important than protected sites. J Ornithol: 1–10. Pannekoek J, Van Strien AJ (2005) TRIM 3 Manual (Trends and Indices for Monitoring Data). Statistics Netherlands, Voorburg, The Netherlands. Wetlands International (2006) Waterbird population estimates. Fourth Edition. Wetlands International, Wageningen, The Netherlands. Wetlands International (2019) Waterbird Population Estimates. Available at: wpe.wetlands.org (accessed 10 March 2019).

Denmark: Russia/Germany & Netherlands

Breeding population size: Nielsen, R.D., Holm, T.E., Clausen, P., Bregnballe, T., Clausen, K.K., Petersen, I.K., Sterup, J., Balsby, T.J.S., Pedersen, C.L., Mikkelsen, P. & Bladt, J. (2019). Fugle 2012-2017. NOVANA. Aarhus Universitet, DCE – Nationalt Center for Miljø og Energi. - Videnskabelig rapport nr. 314. http://dce2.au.dk/pub/SR314.pdf and http://novana.au.dk/fugle/
Breeding short-term trend: Holm, T.E., Clausen, P., Nielsen, R.D., Bregnballe, T., Petersen, I.K., Mikkelsen, P., Bladt, J., Kotzerka, J. & Søgaard, B. 2016. Fugle 2015. NOVANA. Aarhus Universitet, DCE – Nationalt Center for Miljø og Energi, 142 s. - Videnskabelig rapport fra DCE - Nationalt Center for Miljø og Energi nr. 210 Nyegaard, T., Meltofte, H., Tofft, J. & Grell, M.B. (2014). Truede og sjældne ynglefugle i Danmark 1998-2012. – Dansk Ornitologisk Forenings Tidsskrift 108: 1-144.
Winter population size: Nielsen, R.D., Holm, T.E., Clausen, P., Bregnballe, T., Clausen, K.K., Petersen, I.K., Sterup, J., Balsby, T.J.S., Pedersen, C.L., Mikkelsen, P. & Bladt, J. (2019). Fugle 2012-2017. NOVANA. Aarhus Universitet, DCE – Nationalt Center for Miljø og Energi. - Videnskabelig rapport nr. 314. http://dce2.au.dk/pub/SR314.pdf and http://novana.au.dk/fugle/
Winter short-term trend: Nielsen, R.D., Holm, T.E., Clausen, P., Bregnballe, T., Clausen, K.K., Petersen, I.K., Sterup, J., Balsby, T.J.S., Pedersen, C.L., Mikkelsen, P. & Bladt, J. (2019). Fugle 2012-2017. NOVANA. Aarhus Universitet, DCE – Nationalt Center for Miljø og Energi. - Videnskabelig rapport nr. 314. http://dce2.au.dk/pub/SR314.pdf and http://novana.au.dk/fugle/
Winter long-term trend: Nielsen, R.D., Holm, T.E., Clausen, P., Bregnballe, T., Clausen, K.K., Petersen, I.K., Sterup, J., Balsby, T.J.S., Pedersen, C.L., Mikkelsen, P. & Bladt, J. (2019). Fugle 2012-2017. NOVANA. Aarhus Universitet, DCE – Nationalt Center for Miljø og Energi. - Videnskabelig rapport nr. 314. http://dce2.au.dk/pub/SR314.pdf and http://novana.au.dk/fugle/

DK: Greenland: Greenland flyway population

Breeding population size: Mitchell & Hall 2018. Wildfowl and Wetlands Trust Report
Breeding short-term trend: Mitchell C. & Brides, K. 2017. Icelandic-breeding goose census 2016. – Goose News 16: 16.
Breeding long-term trend: Mitchell C. & Brides, K. 2017. Icelandic-breeding goose census 2016. – Goose News 16: 16.

Branta leucopsis (Barnacle Goose)

Estonia: Russia/Germany & Netherlands

Breeding population size: Estonian Working Group on Bird Status and Numbers
Breeding short-term trend: Estonian Working Group on Bird Status and Numbers
Breeding long-term trend: Estonian Working Group on Bird Status and Numbers

Finland: Russia/Germany & Netherlands

Breeding population size: Lehtikainen, 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: Below, A., Mikkola-Roos, M., Kurvinen, L. & Lehtikainen, A. 2019: Saaristolintukantojen kehitys vuosina 1980–2018. – Linnut-vuosikirja 2018: 56-67.
Breeding long-term trend: Hario, M. & Rintala, J. 2011: Saaristolintukantojen kehitys Suomessa 1986-2010. Linnut vuosikirja 2010:40-51

Germany: Russia/Germany & Netherlands

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

Iceland: East Greenland/Scotland & Ireland

Breeding population size: Lilja Jóhannesdóttir, Kristín Hermannsdóttir & Svenja N. V. Auhage 2020. Varpútbreiðsla helsingja á Suð austurlandi 2019. Náttúrustofa Suð austurlands, Höfn í Hornafirði, janúar 2020. Memo 5pp.
Breeding short-term trend: Kristinn Haukur Skarphéðinsson og Svenja N.V. Auhage 2012. Helsingjar við Hólmsá. Náttúrufræðistofnun Íslands, NÍ-12008. Reykjavík: Garðabær; Jóhann Helgi Stefánsson, Kristín Hermannsdóttir, Snævarr Guðmundsson, 2015. Helsingjar í Austur-Skaftafellssýslu – stofnstærð og varpútbreiðsla 2014. Náttúrustofa Suð austurlands, Höfn í Hornafirði; Lilja Jóhannesdóttir, Kristín Hermannsdóttir & Svenja N. V. Auhage 2020. Varpútbreiðsla helsingja á Suð austurlandi 2019. Náttúrustofa Suð austurlands, Höfn í Hornafirði, janúar 2020. Minnisblað 5 bls.
Breeding long-term trend: Kristinn Haukur Skarphéðinsson og Svenja N.V. Auhage 2012. Helsingjar við Hólmsá. Náttúrufræðistofnun Íslands, NÍ-12008. Reykjavík: Garðabær; Jóhann Helgi Stefánsson, Kristín Hermannsdóttir, Snævarr Guðmundsson, 2015. Helsingjar í Austur-Skaftafellssýslu – stofnstærð og varpútbreiðsla 2014. Náttúrustofa Suð austurlands, Höfn í Hornafirði; Lilja Jóhannesdóttir, Kristín Hermannsdóttir & Svenja N. V. Auhage 2020. Varpútbreiðsla helsingja á Suð austurlandi 2019. Náttúrustofa Suð austurlands, Höfn í Hornafirði, janúar 2020. Minnisblað 5 bls.

Republic of Ireland: East Greenland/Scotland & Ireland

Winter population size: Doyle, S., Walsh, A., McMahon, B.J. & Tierney, T.D. (2018) Barnacle Geese <i>Branta leucopsis</i> in Ireland: results of the 2018 census. Irish Birds 11:1.
Winter short-term trend: Walsh, A.J. & Crowe, O. (2008) Barnacle Geese <i>Branta leucopsis</i> in Ireland, spring 2008. Irish Birds 8: 430 - 432. Doyle, S., Walsh, A., McMahon, B.J. & T.D. Tierney (2018) Barnacle Geese <i>Branta leucopsis</i> in Ireland: results of the 2018 census. Irish Birds 11:1.
Winter long-term trend: Merne, O.J. & Walsh, A.J. (1994) Barnacle Geese <i>Branta leucopsis</i> in Ireland, spring 1993 and 1994. Irish Birds 5: 151 - 156. Doyle, S., Walsh, A., McMahon, B.J. & T.D. Tierney (2018) Barnacle Geese <i>Branta leucopsis</i> in Ireland: results of the 2018 census. Irish Birds 11:1.

Netherlands: Russia/Germany & Netherlands

Breeding population size: Sovon Bird atlas (Sovon 2018)
Breeding short-term trend: NEM (Sovon, RWS, CBS, provinces)
Breeding long-term trend: Sovon (2002), Sovon Bird atlas (2018)
Winter population size: NEM waterbird monitoring scheme (Sovon, RWS, CBS, provinces)
Winter short-term trend: NEM waterbird monitoring scheme (Sovon, RWS, CBS, provinces)
Winter long-term trend: NEM waterbird monitoring scheme (Sovon, RWS, CBS, provinces)

NO: Svalbard

Breeding population size: The Wildfowl & Wetlands Trust
Breeding short-term trend: The Wildfowl & Wetlands Trust
Breeding long-term trend: The Wildfowl & Wetlands Trust

Poland: Russia/Germany & Netherlands

Winter population size: State Environmental Monitoring / Chief Inspectorate of Environmental Protection (survey: MNG – Geese Survey); A. Sikora - unpublished information
Winter short-term trend: State Environmental Monitoring / Chief Inspectorate of Environmental Protection (survey: MNG)
Winter long-term trend: Chief Inspectorate of Environmental Protection & Polish Society for the Protection of Birds (OTOP) / BirdLife Poland

Russia

Breeding population size: Pokrovskaya in press
Breeding short-term trend: Kondratiev et al. 2012; CAFF 2018; Artemiev in press
Breeding long-term trend: Mineev & Mineev 2001; 2004; Morozov & Syroechkovskiy 2004; Kondratiev et al. 2012

Branta leucopsis (Barnacle Goose)

Spain: East Greenland/Scotland & Ireland

Winter population size: Información proporcionada por las Comunidades Autónomas. SEO/BirdLife (2012). Atlas de las aves en invierno en España 2007-2010. Ministerio de Agricultura, Alimentación y Medio Ambiente-SEO/ BirdLife. Madrid. 817 pp. (https://www.miteco.gob.es/es/biodiversidad/temas/inventarios-nacionales/atlas_aves_invierno_tcm30-198034.pdf)

Winter short-term trend: Información proporcionada por las Comunidades Autónomas. SEO/BirdLife (2012). Atlas de las aves en invierno en España 2007-2010. Ministerio de Agricultura, Alimentación y Medio Ambiente-SEO/ BirdLife. Madrid. 817 pp. (https://www.miteco.gob.es/es/biodiversidad/temas/inventarios-nacionales/atlas_aves_invierno_tcm30-198034.pdf) SEO/BirdLife (2019). Programas de seguimiento y grupos de trabajo de SEO/BirdLife 2018. SEO/BirdLife. Madrid. (<https://doi.org/10.31170/0073>)

Winter long-term trend: Información proporcionada por las Comunidades Autónomas. SEO/BirdLife (2012). Atlas de las aves en invierno en España 2007-2010. Ministerio de Agricultura, Alimentación y Medio Ambiente-SEO/ BirdLife. Madrid. 817 pp. (https://www.miteco.gob.es/es/biodiversidad/temas/inventarios-nacionales/atlas_aves_invierno_tcm30-198034.pdf) SEO/BirdLife (2019). Programas de seguimiento y grupos de trabajo de SEO/BirdLife 2018. SEO/BirdLife. Madrid. (<https://doi.org/10.31170/0073>)

Sweden: Russia/Germany & Netherlands

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: Species observation system, www.artportalen.se

Breeding long-term trend: Svensk fågeltaxering - Swedish Bird Survey, BirdLife Sverige annual reports

Winter population size: Nilsson, L. & Haas, F. 2016. Distribution and numbers of wintering waterbirds in Sweden in 2015 and changes during the last fifty years. Ornis Svecica 26: 3-60. Haas, F. & Nilsson, L. 2018. International counts of staging and wintering waterbirds and geese in Sweden. Annual report for 2017/2018. Lund University.

Winter short-term trend: Haas, F. & Nilsson, L. 2018. International counts of staging and wintering waterbirds and geese in Sweden. Annual report for 2017/2018. Lund University.

Winter long-term trend: Nilsson, L. & Haas, F. 2016. Distribution and numbers of wintering waterbirds in Sweden in 2015 and changes during the last fifty years. Ornis Svecica 26: 3-60. Haas, F. & Nilsson, L. 2018. International counts of staging and wintering waterbirds and geese in Sweden. Annual report for 2017/2018. Lund University.

United Kingdom: East Greenland/Scotland & Ireland

Winter population size: Mitchell, C. & Hall, C. in press. Greenland Barnacle Geese *Branta leucopsis* in Britain and Ireland: results of the international census, spring 2018. Wildfowl & Wetlands Trust, Slimbridge. Survey in March 2018.

Winter short-term trend: Worden, J., Michell, C.R., Merne, O.J. & Cranswick, P.A. 2004. Greenland Barnacle Goose *Branta leucopsis* in Britain and Ireland: results of the international census, March 2003. The Wildfowl & Wetlands Trust, Slimbridge. Mitchell, C. & Hall, C. 2018. Greenland Barnacle Geese *Branta leucopsis* in Britain and Ireland: Results of the international census, spring 2018. WWT, Slimbridge.

Winter long-term trend: Ogilvie, M.A. 1983. The numbers of Greenland Barnacle Geese in Britain and Ireland. Wildfowl 34: 77-88. Mitchell C, Hall C (2018) Greenland Barnacle Geese *Branta leucopsis* in Britain and Ireland: Results of the international census, spring 2018. WWT, Slimbridge.

United Kingdom: Svalbard/South-west Scotland

Winter population size: Frost, T.M., Austin, G.E., Hearn, R.D., McAvoy, S.G., Robinson, A., Stroud, D.A., Woodward, I.D. & Wotton, S.R. 2019. Population estimates of wintering waterbirds in Great Britain. British Birds 112: 130-145.

Winter short-term trend: Frost, T.M., Austin, G.E., Calbrade, N.A., Mellan, H.J., Hearn, R.D., Stroud, D.A., Wotton, S.R. & Balmer, D.E. (2018). Waterbirds in the UK 2016/17: The Wetland Bird Survey. BTO, RSPB and JNCC, in association with WWT. British Trust for Ornithology, Thetford. 40 pp.

Winter long-term trend: Frost, T.M., Austin, G.E., Calbrade, N.A., Mellan, H.J., Hearn, R.D., Stroud, D.A., Wotton, S.R. & Balmer, D.E. (2018). Waterbirds in the UK 2016/17: The Wetland Bird Survey. BTO, RSPB and JNCC, in association with WWT. British Trust for Ornithology, Thetford. 40 pp.

United Kingdom: non-native populations

Breeding population size: Derived from non-breeding estimate divided by three. Frost, T.M., Austin, G.E., Hearn, R.D., McAvoy, S.G., Robinson, A., Stroud, D.A., Woodward, I.D. & Wotton, S.R. 2019. Population estimates of wintering waterbirds in Great Britain. British Birds 112: 130-145. Population breeding at Strangford Lough believed to be the only naturalised birds in Northern Ireland.

Breeding short-term trend: Frost, T.M., Austin, G.E., Calbrade, N.A., Mellan, H.J., Hearn, R.D., Stroud, D.A., Wotton, S.R. & Balmer, D.E. (2018). Waterbirds in the UK 2016/17: The Wetland Bird Survey. BTO, RSPB and JNCC, in association with WWT. British Trust for Ornithology, Thetford. 40 pp.

Breeding long-term trend: Frost, T.M., Austin, G.E., Calbrade, N.A., Mellan, H.J., Hearn, R.D., Stroud, D.A., Wotton, S.R. & Balmer, D.E. (2018). Waterbirds in the UK 2016/17: The Wetland Bird Survey. BTO, RSPB and JNCC, in association with WWT. British Trust for Ornithology, Thetford. 40 pp.

Bibliography

- Billerman, S.M., Keeney, B.K., Rodewald, P.G. and Schulenberg, T.S. (eds). 2020. Birds of the World. Cornell Laboratory of Ornithology, Ithaca.
- Bird, J. P., Martin, R., Akçakaya, H. R., Gilroy, J., Burfield, I. J., Garnett, S. G., Symes, A., Taylor, J., Sekercioglu, Ç. H. and Butchart, S. H. M. 2020. Generation lengths of the world's birds and their implications for extinction risk. *Conservation Biology* 34(5): 1252-1261. DOI: 10.1111/cobi.13486.
- Cope, D. R.; Pettifor, R. A.; Griffin, L. R.; Rowcliffe, J. M. 2003. Integrating farming and wildlife conservation: the Barnacle Goose Management Scheme. *Biological Conservation* 110: 113-122.
- Delany, S. and Scott, D. 2006. Waterbird population estimates. Wetlands International, Wageningen, The Netherlands.
- Johnsgard, P.A. 1978. Ducks, geese and swans of the World. University of Nebraska Press, Lincoln and London.
- Kear, J. 2005. Ducks, geese and swans volume 1: general chapters; species accounts (Anhima to Salvadorina). Oxford University Press, Oxford, U.K.
- Madge, S. and Burn, H. 1988. Wildfowl. Christopher Helm, London.
- Madsen, J., Bregnballe, T. and Hastrup, A. 1992. Impact of the Arctic Fox *Alopex lagopus* on nesting success of geese in south-east Svalbard, 1989. *Polar Research* 11(2): 35-39.
- Peberdy, K. 1991. The use of grazed saltmarsh by *Branta leucopsis* (barnacle goose) in relation to refuge establishment and management. In: Finlayson, C. M.; Larsson, T. (ed.), *Wetland management and restoration*, pp. 95-107. Swedish Environmental Protection Agency, Solna.
- Scott, D.A. and Rose, P.M. 1996. Atlas of Anatidae populations in Africa and western Eurasia. Wetlands International, Wageningen, Netherlands.
- Snow, D.W. and Perrins, C.M. 1998. The Birds of the Western Palearctic, Volume 1: Non-Passerines. Oxford University Press, Oxford.
- Vickery, J. A.; Gill, J. A. 1999. Managing grassland for wild geese in Britain: a review. *Biological Conservation* 89: 93-106.
- del Hoyo, J., Elliot, A. & Sargatal, J. (ed.). 1992. Handbook of the Birds of the World, Vol. 1: Ostrich to Ducks. Lynx Edicions, Barcelona, Spain.