Birds’ demographic parameters and bibliographical references

Here is provided a list of demographic parameters for each bird species investigated and the corresponding data found in literature as well as the citation of article/s from which the data was extracted.

\*\*you can find tables with epidemiological parameters for each bird species in **Bird’s epidemiological parameters and bibliographical references**

# Blackbird (*Turdus merula*)

|  |  |  |
| --- | --- | --- |
| **Parameter** | **Data** | **Reference** |
| Population | Approximately 90.000 couples in Lombardy region.  4-6 couples/km2 in Milan | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| 904 individuals detected in Lombardy region during breeding season | Brambilla M, Calvi G. and Vitulano S. (2021) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Habitat | Mostly forests and shrubs | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Population distribution in Lombardy region | 10% coniferous forests  20% in high plain  26% arable land  28% broadleaved woods  5% rice plain  1% Alps  11% urban plain | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Annual Growth Rate | 1.247 | Brambilla M, Calvi G. and Vitulano S. (2021) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Migratory strategy | Partially migrant/short range | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Breeding season | Mid-March/mid-June | Zeraoula A. et al. (2016) ‘Breeding biology of the European Blackbird *Turdus merula* in orange orchards’, *Journal of King Saud University – Science*, vol.28, no.4, pp. 300-307 |
| May-July | Spina F. and Volponi S. (2008) ‘Atlante della migrazione degli uccelli in Italia’, *ISPRA*, vol.2 |
| 1 March – 30 June | Brambilla M, Calvi G. and Vitulano S. (2021) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Date of first egg laying | 22 April  (22 March min  14 June max) | BTO <https://www.bto.org/> |
| Number of broods per year | 2 or more | Magrath R. (1991) ‘Nestling Weight and Juvenile Survival in the Blackbird, Turdus merula’, *The Journal of Animal Ecology*, vol. 60, no. 1, pp. 335-351 |
| 2-3 | Desrochers A. and Magrath R (1993) ‘Age-specific fecundity in European blackbirds (*Turdus merula*): Individual and population trends’, vol. 110, no. 2, pp. 255-263 |
| 2-3 | BTO <https://www.bto.org/> |
| Number of eggs laid per nest | Between 2 (23.07%) and 4 (19.23%) eggs; majority of nests (57.69%) 3 eggs | Zeraoula A. et al. (2016) ‘Breeding biology of the European Blackbird *Turdus merula* in orange orchards’, *Journal of King Saud University – Science*, vol.28, no.4, pp. 300-307 |
| 3 - 4 eggs | 3.86 (mean) ± 0.75 (SD) (2 min – 7 max) | BTO <https://www.bto.org/> |
| 2.96 ± 0.05 | Zeraoula A. et al. (2016) ‘Breeding biology of the European Blackbird *Turdus merula* in orange orchards’, *Journal of King Saud University – Science*, vol.28, no.4, pp. 300-307 |
| Incubation period | 13 – 14 days | 12.97 (mean) ± 1.34 (SD)  (10.5 min – 15.5 max) | BTO <https://www.bto.org/> |
| Hatching success | 92-95% | Snow D.W. (2008) ‘The Breeding of the blackbird Turdus merula at Oxford’, *Ibis*, vol. 100, no. 1, pp. 1-30 |
| Fledging period | 14-18 days after hatching  15. 71 (mean) ± 0.10 (SD) | Zeraoula A. et al. (2016) ‘Breeding biology of the European Blackbird *Turdus merula* in orange orchards’, *Journal of King Saud University – Science*, vol.28, no.4, pp. 300-307 |
| 13-14 days after hatching | Magrath R. (1991) ‘Nestling Weight and Juvenile Survival in the Blackbird, Turdus merula’, *The Journal of Animal Ecology*, vol. 60, no. 1, pp. 335-351 |
| 13.5 - 16 days | 14.64 (mean) ± 1.54 (SD) (12 min – 17 max) | BTO <https://www.bto.org/> |
| 14 days after hatching | Observatoire Européen  <https://www.observatoiremigrateurs.com/it/merle-noir/> |
| Parental care | 15-25 days after fledging | Snow D.W. (2008) ‘The Breeding of the blackbird Turdus merula at Oxford’, *Ibis*, vol. 100, no. 1, pp. 1-30 |
| Daily nestling survival rate | 0.989 ± 0.0007 | Zeraoula A. et al. (2016) ‘Breeding biology of the European Blackbird *Turdus merula* in orange orchards’, *Journal of King Saud University – Science*, vol.28, no.4, pp. 300-307 |
| Overall survival rate during the nestling period | 64.8% | Zeraoula A. et al. (2016) ‘Breeding biology of the European Blackbird *Turdus merula* in orange orchards’, *Journal of King Saud University – Science*, vol.28, no.4, pp. 300-307 |
| Juvenile mortality rate | 12.4% | Observatoire Européen  <https://www.observatoiremigrateurs.com/it/merle-noir/> |
| Juvenile survival | 0.564 (in the first year) | BTO <https://www.bto.org/> |
| Adult survival | 0.650 (mean) ± 0.003 (SD) | BTO <https://www.bto.org/> |
| Survival rate | 70% do not survive the first fall | Spina F. and Volponi S. (2008) ‘Atlante della migrazione degli uccelli in Italia’, *ISPRA*, vol.2 |
| Survival rate calculated from breeding population | 67% | Snow D.W. (1958) ‘A Study of Blackbirds’, Allen and Unwin, London. |
| Survival rate calculated from ringing recoveries | 60% | Lack D. (1943) ‘The Age of the Blackbird’, *The British Trust for Ornithology*, vol. 36, pp. 161-175. |
| 57% | Coulson J.C. (1961) ‘The Post-Fledging Mortality of the Blackbird in Great Britain’, *Bird study*, vol. 8, no. 2, pp. 89-97 |
| Mean life | 2.4 years | <https://web.archive.org/web/20070424192443/http:/www.garden-birds.co.uk/information/lifespan.htm> |
| 3 years | BTO <https://www.bto.org/> |
| Age at first breeding | 1 | BTO <https://www.bto.org/> |
| Birds size | Length 24cm  Wingspan 36cm  Weight 100g | BTO <https://www.bto.org/> |
| Egg size | Length 29mm  Width 21mm  Weight 7.2g (% of shell 6) | BTO <https://www.bto.org/> |
| Nest height above the ground | 0.97m (mean) ± 0.76 (SD)  1.11m ± 1.14  1.58m ± 1.67  (3 different years measurements) | Hatchwell B.J. et al. (2008) ‘The reproductive success of Blackbirds Turdus merula in relation to habitat structure and choice of nest site’, *Ibis*, vol. 138, no. 2, pp. 256-262 |
| 1.93m  1.40m  2.05m  (3 different years measurements) | Grégoire A. et al. (2003) ‘Nest predation in Blackbirds (*Turdus merula*) and the influence of nest characteristics’, *Ornis Fennica*, vol. 80, no. 1, pp. 1-10 |

# Italian/tree/house sparrow (*Passer italiae/montanus/domesticus*)

|  |  |  |
| --- | --- | --- |
| **Parameter** | **Data** | **Reference** |
| Population | 110.000 family groups in Lombardy region. ≥ 10 family groups/km2 in Milan | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| 462 individuals detected in Lombardy region during the breeding season | Brambilla M, Calvi G. and Vitulano S. (2021) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Habitat | Agro-ecosystems | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Population distribution in Lombardy region | 1% coniferous forests  12% in high plain  57% arable land  5% broadleaved woods  11% rice plain  0% Alps  14% urban plain | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Annual Growth Rate | -1.289 | Brambilla M, Calvi G. and Vitulano S. (2021) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Migratory strategy | Partially migrant/short-range | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Breeding season | April-August | <https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/house-sparrow/breeding/> |
| 15 March - 18 July | Brichetti P., Caffi M., Gandini S. (1993) ‘Biologia riproduttiva di una popolazione di Passera d’Italia, *Passer italiae*, nidificante in una “colombaia” della pianura lombarda’, *Avocetta*, vol. 17, pp. 65-71 |
| 1 April - 10 July | Brambilla M, Calvi G. and Vitulano S. (2021) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| March – August (complete breeding season) | García-Navas V. et al. (2008) ‘Effect of nestbox type on occupancy and breeding biology of Tree Sparrows *Passer montanus* in central Spain: Nestbox type and breeding ecology in Tree Sparrows’, *Ibis*, vol. 150, no. 2, pp. 356-364 |
| Date of first egg laying | 17 May (23 April – 16 July) | BTO <https://www.bto.org/> |
| 14.14 ± 10.07 (days starting from 1 April) | García-Navas V. et al. (2008) ‘Effect of nestbox type on occupancy and breeding biology of Tree Sparrows *Passer montanus* in central Spain: Nestbox type and breeding ecology in Tree Sparrows’, *Ibis*, vol. 150, no. 2, pp. 356-364 |
| Number of broods per year | 2-3 | <https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/house-sparrow/breeding/> |
| 3 | Sorace A. and Carere C. (1996) ‘Occupation and breeding parameters in the Great Tit *Parus major* and the Italian Sparrow *Passer italiae* in nest-boxes of different size’, *Ornis Svecica*, vol. 6, pp. 173-177 |
| 2-3 attempts (1° at the beginning of April/May – 2° mid-May/June- 3° July/beginning of August) | García-Navas V. et al. (2008) ‘Nestbox Use and Reproductive Parameters of Tree Sparrows *Passer montanus*: Are They Affected by the Presence of Old Nests?’, *Acta Ornithologica*, vol. 43, no. 1, pp. 32-42 |
| Number of eggs laid per nest | 2-5 | <https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/house-sparrow/breeding/> |
| 5.3 (between 2 and 8) | Brichetti P. (1992) ‘Biometria delle uova e dimensione delle covate in alcune specie di Charadriiformes e Passeriformes nidificanti in Italia’, *Rivista Italiana di Ornitologia*, vol. 62, pp. 136-144 |
| 5.1-5.5 | Sorace A. and Carere C. (1996) ‘Occupation and breeding parameters in the Great Tit *Parus major* and the Italian Sparrow *Passer italiae* in nest-boxes of different size’, *Ornis Svecica*, vol. 6, pp. 173-177 |
| 5 - 6 eggs | 5.05 (media) ± 0.92 (DS) (2 min – 9 max) | BTO <https://www.bto.org/> |
| 5 ± 0.1 (DS) | García-Navas V. et al. (2008) ‘Nestbox Use and Reproductive Parameters of Tree Sparrows *Passer montanus*: Are They Affected by the Presence of Old Nests?’, *Acta Ornithologica*, vol. 43, no. 1, pp. 32-42 |
| 1° clutch 5 eggs (mean), 2° clutch 5.36 eggs (mean), 3° clutch 4.81 eggs (mean) | Dolenec P. et al. (2011) ‘Intra-seasonal changes in reproductive strategy of a multi-brooded passerine: the tree sparrow *Passer montanus*’, *Ethology Ecology & Evolution*, vol. 23, no. 4, pp. 368-374 |
| 4.80 (mean) ± 0.67 (2 min – 7 max) | García-Navas V. et al. (2008) ‘Effect of nestbox type on occupancy and breeding biology of Tree Sparrows *Passer montanus* in central Spain: Nestbox type and breeding ecology in Tree Sparrows’, *Ibis*, vol. 150, no. 2, pp. 356-364 |
| Incubation period | 12 - 13 days | 12.80 (mean) ± 1.19 (SD) (11 min – 15 max) | BTO <https://www.bto.org/> |
| 10-11 days | García-Navas V. et al. (2008) ‘Nestbox Use and Reproductive Parameters of Tree Sparrows *Passer montanus*: Are They Affected by the Presence of Old Nests?’, *Acta Ornithologica*, vol. 43, no. 1, pp. 32-42 |
| 10.84 (mean) ± 1.14 days (8 min – 14 max) | García-Navas V. et al. (2008) ‘Effect of nestbox type on occupancy and breeding biology of Tree Sparrows *Passer montanus* in central Spain: Nestbox type and breeding ecology in Tree Sparrows’, *Ibis*, vol. 150, no. 2, pp. 356-364 |
| Hatching success | About 80% | García-Navas V. et al. (2008) ‘Nestbox Use and Reproductive Parameters of Tree Sparrows *Passer montanus*: Are They Affected by the Presence of Old Nests?’, *Acta Ornithologica*, vol. 43, no. 1, pp. 32-42 |
| 0.81 +/- 0.29 | García-Navas V. et al. (2008) ‘Effect of nestbox type on occupancy and breeding biology of Tree Sparrows *Passer montanus* in central Spain: Nestbox type and breeding ecology in Tree Sparrows’, *Ibis*, vol. 150, no. 2, pp. 356-364 |
| 75.5% | Brichetti P., Caffi M., Gandini S. (1993) ‘Biologia riproduttiva di una popolazione di Passera d’Italia, *Passer italiae*, nidificante in una “colombaia” della pianura lombarda’, *Avocetta*, vol. 17, pp. 65-71 |
| Average number of nestlings per brood at hatching | 4.4 (1 min – 7 max) | Brichetti P., Caffi M., Gandini S. (1993) ‘Biologia riproduttiva di una popolazione di Passera d’Italia, *Passer italiae*, nidificante in una “colombaia” della pianura lombarda’, *Avocetta*, vol. 17, pp. 65-71 |
| Fledging period | 15 - 18 days | 15.94 (mean) ± 1.75 (SD) (12.5 min – 18 max) | BTO <https://www.bto.org/> |
| 14-16 days after hatching | <https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/house-sparrow/breeding/> |
| Overall nestlings breeding period | 13.2 days | Brichetti P., Caffi M., Gandini S. (1993) ‘Biologia riproduttiva di una popolazione di Passera d’Italia, *Passer italiae*, nidificante in una “colombaia” della pianura lombarda’, *Avocetta*, vol. 17, pp. 65-71 |
| Average number of nestlings per brood at fledging | 3.5 | Brichetti P., Caffi M., Gandini S. (1993) ‘Biologia riproduttiva di una popolazione di Passera d’Italia, *Passer italiae*, nidificante in una “colombaia” della pianura lombarda’, *Avocetta*, vol. 17, pp. 65-71 |
| Number of fledged per couple | About 7 | Sasvfiri L. and Hegyi Z. (1994) ‘Reproductive effort of colonial and solitary breeding tree sparrows Passer montanus L.’, *Behavioral ecology and sociobiology*, vol. 34, pp. 113-123 |
| Fledging rate (% of nestlings fledged on hatched) | 82.2% | Brichetti P., Caffi M., Gandini S. (1993) ‘Biologia riproduttiva di una popolazione di Passera d’Italia, *Passer italiae*, nidificante in una “colombaia” della pianura lombarda’, *Avocetta*, vol. 17, pp. 65-71 |
| Fledgin success | 67-80% | García-Navas V. et al. (2008) ‘Nestbox Use and Reproductive Parameters of Tree Sparrows *Passer montanus*: Are They Affected by the Presence of Old Nests?’, *Acta Ornithologica*, vol. 43, no. 1, pp. 32-42 |
| Nestling mortality rate | About 4-6% for 2 broods About 15-20% (min 6% max 31%) for 3 broods | Sasvfiri L. and Hegyi Z. (1994) ‘Reproductive effort of colonial and solitary breeding tree sparrows Passer montanus L.’, *Behavioral ecology and sociobiology*, vol. 34, pp. 113-123 |
| Adult survival | 0.433 ± 0.067 | BTO <https://www.bto.org/> |
| Survival rate calculated from ringing recoveries | 56% | Summers-Smith D. (1963) ‘The House Sparrow’. Collins, London. |
| Mean life | 2 years | BTO <https://www.bto.org/> |
| Age at first breeding | 1 | BTO <https://www.bto.org/> |
| Birds size | Length 14cm Wingspan 21cm Weight 24g | BTO <https://www.bto.org/> |
| Egg size | Length 20mm Width 14mm Weight 2.1g (% of shell 7) | BTO <https://www.bto.org/> |
| Nest height above the ground | 5.7m (mean) 32.2m max-2.05m min | Indykiewicz P. (1991) ‘Nests and nest-sites of the house sparrow Passer domesticus (Linnaeus, 1758) in urban, suburban and rural environments’, *Acta Zoologica Cracoviensia*, vol. 34, no. 2, pp. 475-495 |

# Magpie (*Pica pica*)

|  |  |  |
| --- | --- | --- |
| **Parameter** | **Data** | **Reference** |
| Population | 14.000 reproductive units in Lombardy region.  1.5 couples/km2 in Milan | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| 331 individuals detected during breeding season | Brambilla M, Calvi G. and Vitulano S. (2021) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Habitat | Agro-ecosystems | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Population distribution in Lombardy region | 0% coniferous forests  10% in high plain  70% arable land  1% broadleaved woods  10% rice plain  0% Alps  10% urban plain | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Annual Growth Rate | 6.413 | Brambilla M, Calvi G. and Vitulano S. (2021) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Migratory strategy | Resident | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Breeding season | 20 March – 31 July | Brambilla M, Calvi G. and Vitulano S. (2021) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Date of first egg laying | 22 April (mean) | Hogstedt G. (1981) ‘Effect of Additional Food on Reproductive Success in the Magpie (Pica pica)’, *The Journal of Animal Ecology*, vol. 50, no. 1, pp. 219-229 |
| 22 April (mean) (8 April min – 4 May max) | BTO <https://www.bto.org/> |
| Number of broods per year | 1 | BTO <https://www.bto.org/> |
| Number of eggs laid per nest | 6.80 ± 1.14 | Ponz A. and Gil-Delgado J. (2004) ‘Biologìa reproductiva de la urraca Pica pica en un àrea de montana de Aragòn’, *Ardeola*, vol. 51, no. 2, pp. 411-423 |
| 6 | Hogstedt G. (1981) ‘Effect of Additional Food on Reproductive Success in the Magpie (Pica pica)’, *The Journal of Animal Ecology*, vol. 50, no. 1, pp. 219-229 |
| 5 - 6 eggs | 5.37 (mean) ± 1.27 (SD) (2 min – 9 max) | BTO <https://www.bto.org/> |
| 4-7 (5.6 mean) | Holyoak D. (1967) ‘Breeding biology of the Corvidae’, *Bird Study*, vol. 14, no. 3, pp.153-168 |
| Incubation period | 18-19 days | Royal society for the protection of birds |
| 20 days | 20.05 (mean) ± 1.79 (SD) (17 min - 23.5 max) | BTO <https://www.bto.org/> |
| Hatching success | 57% | Ponz A. and Gil-Delgado J. (2004) ‘Biologìa reproductiva de la urraca Pica pica en un àrea de montana de Aragòn’, *Ardeola*, vol. 51, no. 2, pp. 411-423 |
| 81% | Hogstedt G. (1981) ‘Effect of Additional Food on Reproductive Success in the Magpie (Pica pica)’, *The Journal of Animal Ecology*, vol. 50, no. 1, pp. 219-229 |
| Fledging period | 26-30 giorni | Royal society for the protection of birds |
| 26 - 31 days | 28.03 (mean) ± 3.70 (SD) (21 min – 34 max) | BTO <https://www.bto.org/> |
| 27 days | Holyoak D. (1967) ‘Breeding biology of the Corvidae’, *Bird Study*, vol. 14, no. 3, pp.153-168 |
| 26 days | Ponz A. and Gil-Delgado J. (2004) ‘Biologìa reproductiva de la urraca Pica pica en un àrea de montana de Aragòn’, *Ardeola*, vol. 51, no. 2, pp. 411-423 |
| 20 days (if disturbed) | Holyoak D. (1967) ‘Breeding biology of the Corvidae’, *Bird Study*, vol. 14, no. 3, pp.153-168 |
| Fledging success | 47% | Ponz A. and Gil-Delgado J. (2004) ‘Biologìa reproductiva de la urraca Pica pica en un àrea de montana de Aragòn’, *Ardeola*, vol. 51, no. 2, pp. 411-423 |
| Nestling mortality rate | 23% | Ponz A. and Gil-Delgado J. (2004) ‘Biologìa reproductiva de la urraca Pica pica en un àrea de montana de Aragòn’, *Ardeola*, vol. 51, no. 2, pp. 411-423 |
| Juvenile survival | 0.4 | BTO <https://www.bto.org/> |
| Adult survival | 0.69 | BTO <https://www.bto.org/> |
| Mean life | 3.5 years for males 2 years for females | <https://a-z-animals.com/animals/magpie/> |
| 5 years | BTO <https://www.bto.org/> |
| Age at first breeding | 2 | BTO <https://www.bto.org/> |
| Birds size | Length 45cm  Wingspan 56cm  Weight 220g | BTO <https://www.bto.org/> |
| Egg size | Length 34mm  Width 24mm  Weight 9.9g (% of shell 6) | BTO <https://www.bto.org/> |
| Nest height above the ground | 5.4m (urban areas)  3.8m (rural areas) | Antonov A. and Atanasova D. (2003) ‘Small-scale differences in the breeding ecology of urban and rural Magpies Pica pica’, *Ornis fennica*, vol. 80, pp. 21-30 |
| 6.9 ± 3.15 (average)  1.2-14m (range)  Most nests at 4-8m | Antonov A. and Atanasova D. (2002) ‘Nest-Site Selection in the Magpie *Pica pica* in a High-Density Urban Population of Sofia (Bulgaria), *Acta Ornithologica*, vol. 37, no. 2, pp. 55-66 |

# Hooded crow (*Corvus cornix*)

|  |  |  |
| --- | --- | --- |
| **Parameter** | **Data** | **Reference** |
| Population | More than 40.000 couples nesting in Lombardy region.  About 2 couples/km2 in Milan | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| 1147 individuals detected during the breeding season | Brambilla M, Calvi G. and Vitulano S. (2021) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Habitat | Agro-ecosystems | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Population distribution in Lombardy region | 2% coniferous forests  10% in high plain  48% arable land  7% broadleaved woods  25% rice plain  0% Alps  8% urban plain | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Annual Growth Rate | 0.199 | Brambilla M, Calvi G. and Vitulano S. (2021) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Migratory strategy | Resident | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Breeding season | 1 March – 30 June | Brambilla M, Calvi G. and Vitulano S. (2021) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Date of first egg laying | 19-22 April | Yom-Tov Y. (1974) ‘The Effect of Food and Predation on Breeding Density and Success, Clutch Size and Laying Date of the Crow (Corvus corone L.)’, *The Journal of Animal Ecology*, vol. 43, no. 2, pp. 479-498 |
| 8/9 – 13 April | Breeding Biology of the Hooded Crow *Corvus corone cornix* in Warta River Valley (W Poland) – Zduniak e Kuczyński - 2003 |
| Hatching date | 3-5 May | Richner H. (1989) ‘Habitat-Specific Growth and Fitness in Carrion Crows (*Corvus corone corone*)’, *The Journal of Animal Ecology*, vol. 58, no. 2, pp. 427-440 |
| 29 April - 9 May | Loman J. (1980) ‘Reproduction in a population of the hooded crow Corvus cornix’, Holarctic Ecology, vol. 3, no. 1, pp. 26-35 |
| Number of broods per year | 1 | BTO <https://www.bto.org/> |
| Number of eggs laid per nest | 3.8-4.1 | The Effect of Food and Predation on Breeding Density and Success, Clutch Size and Laying Date of the Crow (Corvus corone L.) - Yom-Tov - 1974 |
| 4.43 (range 2-9) | Zduniak P. and Kuczyński L. (2003) ‘Breeding Biology of the Hooded Crow *Corvus corone cornix* in Warta River Valley (W Poland), Acta Ornithologica, vol. 38, no. 2, pp. 143-150 |
| 4.3 (4.19-4.49) | Zduniak P. (2009) ‘Reproductive success of the hooded crow *Corvus cornix* population in relation to variable hydrological conditions in a flooded river valley (W Poland)’, *Ardeola*, vol. 56, no. 1, pp. 13-24 |
| 3-6 eggs | BTO <https://www.bto.org/> |
| Incubation period | 18 days | Loman J. (1980) ‘Reproduction in a population of the hooded crow Corvus cornix’, Holarctic Ecology, vol. 3, no. 1, pp. 26-35 |
| 20.9 days (20-22) | Zduniak P. and Kuczyński L. (2003) ‘Breeding Biology of the Hooded Crow *Corvus corone cornix* in Warta River Valley (W Poland), Acta Ornithologica, vol. 38, no. 2, pp. 143-150 |
| 21 days | Zduniak P. (2010) ‘Water conditions influence nestling survival in a Hooded Crow Corvus cornix wetland population’, *Journal of Ornithology*, vol. 151, no. 1, pp. 45-50 |
| 18-19 days | BTO <https://www.bto.org/> |
| Hatching success | 46% | Yom-Tov Y. (1974) ‘The Effect of Food and Predation on Breeding Density and Success, Clutch Size and Laying Date of the Crow (Corvus corone L.)’, *The Journal of Animal Ecology*, vol. 43, no. 2, pp. 479-498 |
| 76% | Zduniak P. and Kuczyński L. (2003) ‘Breeding Biology of the Hooded Crow *Corvus corone cornix* in Warta River Valley (W Poland), Acta Ornithologica, vol. 38, no. 2, pp. 143-150 |
| 75% (69-81%) | Zduniak P. (2009) ‘Reproductive success of the hooded crow *Corvus cornix* population in relation to variable hydrological conditions in a flooded river valley (W Poland)’, *Ardeola*, vol. 56, no. 1, pp. 13-24 |
| 75% | Loman J. (1980) ‘Reproduction in a population of the hooded crow Corvus cornix’, Holarctic Ecology, vol. 3, no. 1, pp. 26-35 |
| Incubation survival rate | 85% (83-88%) | Zduniak P. (2010) ‘Water conditions influence nestling survival in a Hooded Crow Corvus cornix wetland population’, *Journal of Ornithology*, vol. 151, no. 1, pp. 45-50 |
| Fledging period | 25-30 days | Yom-Tov Y. (1974) ‘The Effect of Food and Predation on Breeding Density and Success, Clutch Size and Laying Date of the Crow (Corvus corone L.)’, *The Journal of Animal Ecology*, vol. 43, no. 2, pp. 479-498 |
| 28-30 days | BTO <https://www.bto.org/> |
| 30-35 days | Loman J. (1980) ‘Reproduction in a population of the hooded crow Corvus cornix’, Holarctic Ecology, vol. 3, no. 1, pp. 26-35 |
| Fledging success | 26.8% | Yom-Tov Y. (1974) ‘The Effect of Food and Predation on Breeding Density and Success, Clutch Size and Laying Date of the Crow (Corvus corone L.)’, *The Journal of Animal Ecology*, vol. 43, no. 2, pp. 479-498 |
| 70% | Zduniak P. and Kuczyński L. (2003) ‘Breeding Biology of the Hooded Crow *Corvus corone cornix* in Warta River Valley (W Poland), Acta Ornithologica, vol. 38, no. 2, pp. 143-150 |
| Number of fledging per nest | Average 1.48 (1.25-1.71) | Zduniak P. (2009) ‘Reproductive success of the hooded crow *Corvus cornix* population in relation to variable hydrological conditions in a flooded river valley (W Poland)’, *Ardeola*, vol. 56, no. 1, pp. 13-24 |
| 2.15 | Zduniak P. and Kuczyński L. (2003) ‘Breeding Biology of the Hooded Crow *Corvus corone cornix* in Warta River Valley (W Poland), Acta Ornithologica, vol. 38, no. 2, pp. 143-150 |
| Whole nesting period (from laying to fledging) | 53 days | Zduniak P. (2010) ‘Water conditions influence nestling survival in a Hooded Crow Corvus cornix wetland population’, *Journal of Ornithology*, vol. 151, no. 1, pp. 45-50 |
| Whole nesting period survival rate | 37% (33-40%) | Zduniak P. (2010) ‘Water conditions influence nestling survival in a Hooded Crow Corvus cornix wetland population’, *Journal of Ornithology*, vol. 151, no. 1, pp. 45-50 |
| Nestling period | from 21st day to 50th day | Zduniak P. (2010) ‘Water conditions influence nestling survival in a Hooded Crow Corvus cornix wetland population’, *Journal of Ornithology*, vol. 151, no. 1, pp. 45-50 |
| Breeding success | 68-72% | Yom-Tov Y. (1974) ‘The Effect of Food and Predation on Breeding Density and Success, Clutch Size and Laying Date of the Crow (Corvus corone L.)’, *The Journal of Animal Ecology*, vol. 43, no. 2, pp. 479-498 |
| 73% | Zduniak P. and Kuczyński L. (2003) ‘Breeding Biology of the Hooded Crow *Corvus corone cornix* in Warta River Valley (W Poland), Acta Ornithologica, vol. 38, no. 2, pp. 143-150 |
| 50.2% (43.3-57.2%) | Zduniak P. (2009) ‘Reproductive success of the hooded crow *Corvus cornix* population in relation to variable hydrological conditions in a flooded river valley (W Poland)’, *Ardeola*, vol. 56, no. 1, pp. 13-24 |
| Breeding failure rate | 49.8% | Zduniak P. (2009) ‘Reproductive success of the hooded crow *Corvus cornix* population in relation to variable hydrological conditions in a flooded river valley (W Poland)’, *Ardeola*, vol. 56, no. 1, pp. 13-24 |
| Nestling survival rate at 10 days | 31.7% | Yom-Tov Y. (1974) ‘The Effect of Food and Predation on Breeding Density and Success, Clutch Size and Laying Date of the Crow (Corvus corone L.)’, *The Journal of Animal Ecology*, vol. 43, no. 2, pp. 479-498 |
| Nestling Period survival rate | 49% (46-53%) | Zduniak P. (2010) ‘Water conditions influence nestling survival in a Hooded Crow Corvus cornix wetland population’, *Journal of Ornithology*, vol. 151, no. 1, pp. 45-50 |
| Adult mortality | 52-55% | Holyoak D. (1971) ‘Movements and Mortality of Corvidae’, *Birds Study*, vol. 18, no. 2, pp. 97-106 |
| Mean life | 4 years | Just assumed, not found in literature |
| Age at first breeding | 2 | Just assumed, not found in literature |
| Birds size | Length 46cm  Wingspan 98cm  Weight 510g | BTO <https://www.bto.org/> |
| Egg size | Length 43mm  Width 30mm  Weight 19.8g (% of shell 6) | BTO <https://www.bto.org/> |
| Nest height above the ground | 6.4m (average)  3-13 (range) | Kövér L. et al. (2015) ‘Recent colonization and nest site selection of the Hooded Crow (Corvus corone cornix L.) in an urban environment’, *Landscape and Urban Planning*, vol. 133, pp. 78-86 |
| 9-11m (average) in Sweden  9.9-14.5m (average) in Poland  12.6m in Germany  9.9 in Finland | Kövér L. et al. (2015) ‘Recent colonization and nest site selection of the Hooded Crow (Corvus corone cornix L.) in an urban environment’, *Landscape and Urban Planning*, vol. 133, pp. 78-86 |
| 16.4m (mean) ± 2.45 (sd)  12-23m (range) | Kövér L. et al. (2015) ‘Recent colonization and nest site selection of the Hooded Crow (Corvus corone cornix L.) in an urban environment’, *Landscape and Urban Planning*, vol. 133, pp. 78-86 |

# Jay (*Garrulus glandarius*)

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| **Parameter** | **Data** | **Reference** |
| Population | 83 individuals detected during the breeding season | Brambilla M, Calvi G. and Vitulano S. (2021) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Habitat | Forests and shrubs | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Population distribution in Lombardy region | 15% coniferous forests  19% in high plain  11% arable land  48% broadleaved woods  3% rice plain  1% Alps  5% urban plain | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Annual Growth Rate | 2.733 | Brambilla M, Calvi G. and Vitulano S. (2021) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Migratory strategy | Resident | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Breeding season | 15 April – 30 June | Brambilla M, Calvi G. and Vitulano S. (2021) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| 26 April – 20 May | Grahn M. (1990) ‘Seasonal Changes in Ranging Behaviour and Territoriality in the European Jay Garrulus g. glandarius’, *Ornis Scandinavica*, vol. 21, no. 3, pp. 195-201 |
| Date of first egg laying | 31 March (1 March – 30 April) | BTO <https://www.bto.org/> |
| Number of broods per year | 1 | BTO <https://www.bto.org/> |
| Number of eggs laid per nest | 4 - 5 eggs | 4.59 (mean) ± 0.95 (SD) (2 min – 7 max) | BTO <https://www.bto.org/> |
| 3-6 (4.5 mean) | Holyoak D. (1967) ‘Breeding biology of the Corvidae’, *Bird Study*, vol. 14, no. 3, pp. 153-168 |
| Incubation period | 18 - 18 days | 17.74 (mean) ± 1.03 (SD) (16 min - 19.5 max) | BTO <https://www.bto.org/> |
| 16 days | Holyoak D. (1967) ‘Breeding biology of the Corvidae’, *Bird Study*, vol. 14, no. 3, pp. 153-168 |
| Fledging period | 20 - 23 days | 21.58 (mean) ± 2.23 (SD) (18 min – 25 max) | BTO <https://www.bto.org/> |
| 21 days | Holyoak D. (1967) ‘Breeding biology of the Corvidae’, *Bird Study*, vol. 14, no. 3, pp. 153-168 |
| 17 days (if disturbed) | Holyoak D. (1967) ‘Breeding biology of the Corvidae’, *Bird Study*, vol. 14, no. 3, pp. 153-168 |
| Juvenile survival | 0.600 (in first year) | BTO <https://www.bto.org/> |
| Adult survival | 0.590 | BTO <https://www.bto.org/> |
| Mean life | 4 years | BTO <https://www.bto.org/> |
| Age at first breeding | 2 | BTO <https://www.bto.org/> |
| Birds size | Length 34cm  Wingspan 55cm  Weight 170g | BTO <https://www.bto.org/> |
| Egg size | Length 31 mm  Width 23mm  Weight 8.5g (% of shell 6) | BTO <https://www.bto.org/> |
| Nest height above the ground |  | <http://www.uccellidaproteggere.it/Le-specie/Gli-uccelli-in-Italia/Le-specie-protette/GHIANDAIA> |

# Great tit (*Parus major*)

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| **Parameter** | **Data** | **Reference** |
| Population | 310 individuals detected during the breeding season in Lombardy region | Brambilla M, Calvi G. and Vitulano S. (2021) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Habitat | Forests/shrumps | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Population distribution in Lombardy region | 8% coniferous forests  19% in high plain  29% arable land  29% broadleaved woods  7% rice plain  0% Alps  8% urban plain | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Annual Growth Rate | 1.785 | Brambilla M, Calvi G. and Vitulano S. (2021) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Migratory strategy | Resident | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Breeding season | 15 April – 30 June | Brambilla M, Calvi G. and Vitulano S. (2021) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Date of first egg laying | 26 April (10 April - 17 May) | BTO <https://www.bto.org/> |
| 14 April (earliest) – 4 May (latest) | Balen J.H.V. (2002) ‘A Comparative Study of the Breeding Ecology of the Great Tit *Parus major* in Different Habitats’, *Ardea*, vol. 55, no. 1-2, pp. 1-93 |
| 7 April (earliest) – 16 June (latest) (in general around the second half of April) | Gibb J. (2008) ‘The breeding biology of the great and blue titmice’, *Ibis*, vol. 92, no. 4, pp. 507-539 |
| Hatching date | 5 May (earliest) – 25 May (latest) | Balen J.H.V. (2002) ‘A Comparative Study of the Breeding Ecology of the Great Tit *Parus major* in Different Habitats’, *Ardea*, vol. 55, no. 1-2, pp. 1-93 |
| Number of broods per year | 1 (2) | BTO <https://www.bto.org/> |
| 1 (few couples 2) | Balen J.H.V. (2002) ‘A Comparative Study of the Breeding Ecology of the Great Tit *Parus major* in Different Habitats’, *Ardea*, vol. 55, no. 1-2, pp. 1-93 |
| Number of eggs laid per nest | 7 - 9 eggs | 7.94 (mean) ± 1.86 (SD) (2 min – 16 max) | BTO <https://www.bto.org/> |
| Average 9-11 eggs | Balen J.H.V. (2002) ‘A Comparative Study of the Breeding Ecology of the Great Tit *Parus major* in Different Habitats’, *Ardea*, vol. 55, no. 1-2, pp. 1-93 |
| Between 10 and 12 eggs (7 min – 15 max) | Gibb J. (2008) ‘The breeding biology of the great and blue titmice’, *Ibis*, vol. 92, no. 4, pp. 507-539 |
| 6-11 | Witherby H. F. et al. (1938) ‘The Handbook of British Birds’, Vol. 2: Warblers to Owls. Witherby. |
| Incubation period | 13 - 15 days | 13.85 (mean) ± 1.29 (SD) (12 min – 16 max) | BTO <https://www.bto.org/> |
| 12-13 days | Balen J.H.V. (2002) ‘A Comparative Study of the Breeding Ecology of the Great Tit *Parus major* in Different Habitats’, *Ardea*, vol. 55, no. 1-2, pp. 1-93 |
| 12-15 days (13.9 mean) | Gibb J. (2008) ‘The breeding biology of the great and blue titmice’, *Ibis*, vol. 92, no. 4, pp. 507-539 |
| Hatching success | 91-94% | Gibb J. (2008) ‘The breeding biology of the great and blue titmice’, *Ibis*, vol. 92, no. 4, pp. 507-539 |
| Fledging period | 18 - 21 days | 18.06 (mean) ± 1.96 (SD) (15 min - 21.5 max) | BTO <https://www.bto.org/> |
| Nestling period | 18.9 (mean) (between 15 e 22 days) | Gibb J. (2008) ‘The breeding biology of the great and blue titmice’, *Ibis*, vol. 92, no. 4, pp. 507-539 |
| % of young successfully rared | 98-99% | Gibb J. (2008) ‘The breeding biology of the great and blue titmice’, *Ibis*, vol. 92, no. 4, pp. 507-539 |
| %of young died in nest | 1-2% | Gibb J. (2008) ‘The breeding biology of the great and blue titmice’, *Ibis*, vol. 92, no. 4, pp. 507-539 |
| Nestling survival | 71-98% (varies according to hatching period and 1st or 2nd brood)  (Approximately 100% in early broods and about 80% in late broods) | Balen J.H.V. (2002) ‘A Comparative Study of the Breeding Ecology of the Great Tit *Parus major* in Different Habitats’, *Ardea*, vol. 55, no. 1-2, pp. 1-93 |
| Juvenile survival | 0.380 | BTO <https://www.bto.org/> |
| Adult survival | 0.542 (mean) ± 0.011 (SD) | BTO <https://www.bto.org/> |
| Mean life | 3 years | BTO <https://www.bto.org/> |
| Age at first breeding | 1 | BTO <https://www.bto.org/> |
| Birds size | Length 14cm  Wingspan 24cm  Weight 18cm | BTO <https://www.bto.org/> |
| Egg size | Length 18mm  Width 14mm  Weight 1.7g (% of shell 6) | BTO <https://www.bto.org/> |
| Nest height above the ground | 0.3-28m (range)  8.9m (average) ± 6.3 (SD)  Majority of nests (77%) until 12m) | Maziarz M. et al. (2015) ‘Natural nest-sites of Great Tits (*Parus major*) in a primeval temperate forest (Białowieża National Park, Poland)’, *Journal of Ornithology*, vol. 156, no. 3, pp. 613-623 |

# Blackcap (*Sylvia atricapilla*)

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| --- | --- | --- |
| **Parameter** | **Data** | **Reference** |
| Population | 873 individuals detected during the breeding season in Lombardy region | Brambilla M, Calvi G. and Vitulano S. (2021) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Habitat | Forests/Shrubs | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Population distribution in Lombardy region | 13% coniferous forests  16% in high plain  25% arable land  31% broadleaved woods  7% rice plain  1% Alps  8% urban plain | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Annual Growth Rate | 1.111 | Brambilla M, Calvi G. and Vitulano S. (2021) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Migratory strategy | Partially migrant/short-range | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Breeding season | 15 April - 15 July | Brambilla M, Calvi G. and Vitulano S. (2021) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Date of first egg laying | 10 May (26 April 19 June) | BTO <https://www.bto.org/> |
| 30 April (earliest) – 18 June (latest)  mean: last 10 days of May | Wesołowski T. (2011) ‘Blackcap Sylvia atricapilla numbers, phenology and reproduction in a primeval forest—a 33-year study’, *Journal of Ornithology*, vol. 152, no. 2, pp. 319-329 |
| 18-22 May (mean) (SD = 17) | Weidinger K. (2000) ‘The breeding performance of blackcap Sylvia atricapilla in two types of forest habitat’, *Ardea*, vol. 88, no. 2, pp. 225-233 |
| Number of broods per year | 1-2 | BTO <https://www.bto.org/> |
| Number of eggs laid per nest | 4 - 5 eggs | 4.56 (mean) ± 0.73 (SD) (2 min – 7 max) | BTO <https://www.bto.org/> |
| 2 min – 6 max (5 eggs in 64.6% of nests and 4 eggs in 19.6%) | Wesołowski T. (2011) ‘Blackcap Sylvia atricapilla numbers, phenology and reproduction in a primeval forest—a 33-year study’, *Journal of Ornithology*, vol. 152, no. 2, pp. 319-329 |
| 4.52 – 4.73 (mean) SD = 0.7 | Weidinger K. (2000) ‘The breeding performance of blackcap Sylvia atricapilla in two types of forest habitat’, *Ardea*, vol. 88, no. 2, pp. 225-233 |
| 4.69-4.81 (mean) | Remeš V. (2003) ‘Effects of Exotic Habitat on Nesting Success, Territory Density, and Settlement Patterns in the Blackcap (*Sylvia atricapilla*)’, *Conservation Biology*, vol. 17, no. 4, pp. 1127-1133 |
| Brood size | Clutch size – 0.3 eggs | Wesołowski T. (2011) ‘Blackcap Sylvia atricapilla numbers, phenology and reproduction in a primeval forest—a 33-year study’, *Journal of Ornithology*, vol. 152, no. 2, pp. 319-329 |
| Incubation period | 3.80-3.92 (mean) (SD = 1) | Weidinger K. (2000) ‘The breeding performance of blackcap Sylvia atricapilla in two types of forest habitat’, *Ardea*, vol. 88, no. 2, pp. 225-233 |
| 11 days (assumption) | Wesołowski T. (2011) ‘Blackcap Sylvia atricapilla numbers, phenology and reproduction in a primeval forest—a 33-year study’, *Journal of Ornithology*, vol. 152, no. 2, pp. 319-329 |
| Hatching success | 92-96% | Weidinger K. (2000) ‘The breeding performance of blackcap Sylvia atricapilla in two types of forest habitat’, *Ardea*, vol. 88, no. 2, pp. 225-233 |
| Family size (nestlings 8 days old) | Hatched eggs – 0.25 | Wesołowski T. (2011) ‘Blackcap Sylvia atricapilla numbers, phenology and reproduction in a primeval forest—a 33-year study’, *Journal of Ornithology*, vol. 152, no. 2, pp. 319-329 |
| Fledging period | 11 - 12 days | 11.07 (mean) ± 1.30 (SD) (8.5 min – 13 max) | BTO <https://www.bto.org/> |
| Number of fledglings | Clutch size – 0.5 | Wesołowski T. (2011) ‘Blackcap Sylvia atricapilla numbers, phenology and reproduction in a primeval forest—a 33-year study’, *Journal of Ornithology*, vol. 152, no. 2, pp. 319-329 |
| 3.71-3.67 (mean) | Remeš V. (2003) ‘Effects of Exotic Habitat on Nesting Success, Territory Density, and Settlement Patterns in the Blackcap (*Sylvia atricapilla*)’, *Conservation Biology*, vol. 17, no. 4, pp. 1127-1133 |
| Nestling period | 11 days | Wesołowski T. (2011) ‘Blackcap Sylvia atricapilla numbers, phenology and reproduction in a primeval forest—a 33-year study’, *Journal of Ornithology*, vol. 152, no. 2, pp. 319-329 |
| Nest success | 29-33% | Weidinger K. (2000) ‘The breeding performance of blackcap Sylvia atricapilla in two types of forest habitat’, *Ardea*, vol. 88, no. 2, pp. 225-233 |
| 15.5% (8.2 mean) (zone 1)  59% (40.7 mean) (zone 2) | Remeš V. (2003) ‘Effects of Exotic Habitat on Nesting Success, Territory Density, and Settlement Patterns in the Blackcap (*Sylvia atricapilla*)’, *Conservation Biology*, vol. 17, no. 4, pp. 1127-1133 |
| Nestling daily survival rate | 0.945 – 0.987 (range) | Wesołowski T. (2011) ‘Blackcap Sylvia atricapilla numbers, phenology and reproduction in a primeval forest—a 33-year study’, *Journal of Ornithology*, vol. 152, no. 2, pp. 319-329 |
| 0.95 (mean) ± 0.009 (SD) | Weidinger K. (2000) ‘The breeding performance of blackcap Sylvia atricapilla in two types of forest habitat’, *Ardea*, vol. 88, no. 2, pp. 225-233 |
| Daily survival rate egg period | 0.95 (mean) +/- 0.006 (SD) | Weidinger K. (2000) ‘The breeding performance of blackcap Sylvia atricapilla in two types of forest habitat’, *Ardea*, vol. 88, no. 2, pp. 225-233 |
| Daily nest survival rate | 0.93-0.98 (mean) | Remeš V. (2003) ‘Effects of Exotic Habitat on Nesting Success, Territory Density, and Settlement Patterns in the Blackcap (*Sylvia atricapilla*)’, *Conservation Biology*, vol. 17, no. 4, pp. 1127-1133 |
| Overall nesting success | 38% | Wesołowski T. (2011) ‘Blackcap Sylvia atricapilla numbers, phenology and reproduction in a primeval forest—a 33-year study’, *Journal of Ornithology*, vol. 152, no. 2, pp. 319-329 |
| Juvenile survival | 0.356 (in first year) | BTO <https://www.bto.org/> |
| Adult survival | 0.436 ± 0.018 | BTO <https://www.bto.org/> |
| Mean life | 2 years | BTO <https://www.bto.org/> |
| Age at first breeding | 1 | BTO <https://www.bto.org/> |
| Birds size | Length 13cm  Wingspan 22cm  Weight 21g | BTO <https://www.bto.org/> |
| Egg size | Length 20mm  Width 15mm  Weight 2.2g (% of shell 6) | BTO <https://www.bto.org/> |
| Nest height above the ground | 0.56-0.54m (mean) | Remeš V. (2003) ‘Effects of Exotic Habitat on Nesting Success, Territory Density, and Settlement Patterns in the Blackcap (*Sylvia atricapilla*)’, *Conservation Biology*, vol. 17, no. 4, pp. 1127-1133 |
| 0.76m +/- 0.44  0.94m +/- 0.48 | Weidinger K. (2000) ‘The breeding performance of blackcap Sylvia atricapilla in two types of forest habitat’, *Ardea*, vol. 88, no. 2, pp. 225-233 |
| 0.75m (mean) 0.16-1.62 (range)  0.99m (mean) 0.16-2.8 (range) | Węgrzyn E. and Leniowski K. (2011) ‘Nest Site Preference and Nest Success in Blackcaps *Sylvia atricapilla* in Poland’, *Ardeola*, vol. 58, no. 1, pp. 113-124 |

# Collared dove (*Streptopelia decaocto*)

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| **Parameter** | **Data** | **Reference** |
| Population | 50.000-70.000 couples in Lombardy region.  >10 couples/km2 in Milan | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| 421 individuals detected during the breeding season in Lombardy region | Brambilla M, Calvi G. and Vitulano S. (2021) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Habitat | Urban | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Population distribution in Lombardy region | 0% coniferous forests  10% in high plain  63% arable land  3% broadleaved woods  10% rice plain  0% Alps  15% urban plain | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Annual Growth Rate | 1.265 | Brambilla M, Calvi G. and Vitulano S. (2021) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Migratory strategy | Resident | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Breeding season | March-September | Coombs C.F.B. et al. (1981) ‘Collared Doves (*Streptopelia decaocto*) in Urban Habitats’, *The Journal of Applied Ecology*, vol. 18, no. 1, pp. 41.62 |
| Mid-February – Beginning of October  (in England, in the rest of the world all the year with peak in April and mid-August) | Robertson H.A. (1990) ‘Breeding of Collared Doves *Streptopelia decaocto* in rural Oxfordshire, England’, *Bird study*, vol. 37, no. 2, pp. 73-83 |
| 1 February – 31 August | Brambilla M, Calvi G. and Vitulano S. (2021) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Laying season | 27 April -1 June | Hosseini-Moosavi S. et al. (2013) ‘Breeding Biology of Collared Dove (Streptopelia decaocto) in Khuzestan Province, Southwestern Iran’, *Ukrainian Journal of Dermatology Venerology Cosmetology*, vol. 22, no. 1, pp. 51-54 |
| Number of broods per year | 3.8 | Robertson H.A. (1990) ‘Breeding of Collared Doves *Streptopelia decaocto* in rural Oxfordshire, England’, *Bird study*, vol. 37, no. 2, pp. 73-83 |
| 3-6 | BTO <https://www.bto.org/> |
| Number of eggs laid per nest | 89% of completed clutches were of 2 eggs  11% of 1 egg | Robertson H.A. (1990) ‘Breeding of Collared Doves *Streptopelia decaocto* in rural Oxfordshire, England’, *Bird study*, vol. 37, no. 2, pp. 73-83 |
| 2 eggs | 1.93 (mean) ± 0.31 (SD) (1 min – 3 max) | BTO <https://www.bto.org/> |
| Incubation period | 16 - 17 days | 16.41 (mean) ± 1.25 (SD) (14 min - 18.5 max) | BTO <https://www.bto.org/> |
| Hatching success | 59% | Robertson H.A. (1990) ‘Breeding of Collared Doves *Streptopelia decaocto* in rural Oxfordshire, England’, *Bird study*, vol. 37, no. 2, pp. 73-83 |
| 60.5% | Hosseini-Moosavi S. et al. (2013) ‘Breeding Biology of Collared Dove (Streptopelia decaocto) in Khuzestan Province, Southwestern Iran’, *Ukrainian Journal of Dermatology Venerology Cosmetology*, vol. 22, no. 1, pp. 51-54 |
| Fledging period | 16-17 days | Eraud C. et al. (2011) ‘Post-Fledging Movements, Home Range, and Survival of Juvenile Eurasian Collared-Doves in Western France, *The Condor*, vol. 113, no. 1, pp. 150-158 |
| About 18 days | Robertson H.A. (1990) ‘Breeding of Collared Doves *Streptopelia decaocto* in rural Oxfordshire, England’, *Bird study*, vol. 37, no. 2, pp. 73-83 |
| 17-22 days after hatching | Santilli F. ‘Biologia e gestione del piccione’, Corso di formazione di cacciatori operatori per il controllo della fauna selvatica |
| About 21 days after hatching | Hosseini-Moosavi S. et al. (2013) ‘Breeding Biology of Collared Dove (Streptopelia decaocto) in Khuzestan Province, Southwestern Iran’, *Ukrainian Journal of Dermatology Venerology Cosmetology*, vol. 22, no. 1, pp. 51-54 |
| 17 - 19 days | 18.11 (mean) ± 2.24 (SD) (14 min - 21.5 max) | BTO <https://www.bto.org/> |
| Fledging success | 69% | Robertson H.A. (1990) ‘Breeding of Collared Doves *Streptopelia decaocto* in rural Oxfordshire, England’, *Bird study*, vol. 37, no. 2, pp. 73-83 |
| 60.9% | Hosseini-Moosavi S. et al. (2013) ‘Breeding Biology of Collared Dove (Streptopelia decaocto) in Khuzestan Province, Southwestern Iran’, *Ukrainian Journal of Dermatology Venerology Cosmetology*, vol. 22, no. 1, pp. 51-54 |
| Nestling success (% of hatched chicks that fledge) | 62% | Coombs C.F.B. et al. (1981) ‘Collared Doves (*Streptopelia decaocto*) in Urban Habitats’, *The Journal of Applied Ecology*, vol. 18, no. 1, pp. 41.62 |
| Adult survival | 0.642 ± 0.022 (SD) | BTO <https://www.bto.org/> |
| Mean life | 3 years | BTO <https://www.bto.org/> |
| Age at first breeding | 1 | BTO <https://www.bto.org/> |
| Birds size | Length 32cm  Wingspan 51cm  Weight 200g | BTO <https://www.bto.org/> |
| Egg size | Length 31mm  Width 24mm  Weight 9.2g (% of shell 6) | BTO <https://www.bto.org/> |
| Nest height above the ground | 2-8m | Eraud C. et al. (2011) ‘Post-Fledging Movements, Home Range, and Survival of Juvenile Eurasian Collared-Doves in Western France, *The Condor*, vol. 113, no. 1, pp. 150-158 |
| 1.82m (mean) +/- 0.25 (sd)  1.43m-2.05 (range) | Hosseini-Moosavi S. et al. (2013) ‘Breeding Biology of Collared Dove (Streptopelia decaocto) in Khuzestan Province, Southwestern Iran’, *Ukrainian Journal of Dermatology Venerology Cosmetology*, vol. 22, no. 1, pp. 51-54 |
| 4.5m (mean)  1.7-12.5m (range) | Degarmo S. and Wood D. (2016) ‘Eurasian collared-dove (*Streptopelia decaocto*) nesting phenology, reproductive success, and nest site characteristics in southern Oklahoma’, *Bulletin of the Oklahoma Ornithological Society*, vol. 49, no. 4, pp. 17-36 |

# Woodpigeon (*Columba palumbus*)

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| --- | --- | --- |
| **Parameter** | **Data** | **Reference** |
| Population | 588 individuals detected during the breeding season in Lombardy region | Brambilla M, Calvi G. and Vitulano S. (2021) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Habitat | Agro-ecosystems | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Population distribution in Lombardy region | 2% coniferous forests  18% in high plain  46% arable land  10% broadleaved woods  11% rice plain  0% Alps  13% urban plain | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Annual Growth Rate | 7.404 | Brambilla M, Calvi G. and Vitulano S. (2021) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Migratory strategy | Partially migrant / short range | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Breeding season | 15 April -15 July | Brambilla M, Calvi G. and Vitulano S. (2021) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Start in July end in late September/beginning of October | Murton R.K. and Isaacson A.J. (2008) ‘The functional basis of some behavior in the woodpigeon *Columba palumbus*’, *Ibis*, vol. 104, no. 4, pp. 503-521 |
| Start: end of March – beginning of April  End: end of September – beginning of October | Górski W. et al. (1998) ‘Survey and monitoring of breeding habitats: the breeding ecology of the wood pigeon *Columba palumbus* in urban areas of north-west Poland’, *Acta Zoologica Lituanica*, vol. 8, no. 1, pp. 137-143 |
| Length of the breeding season | 175.5-188.2 days | Górski W. et al. (1998) ‘Survey and monitoring of breeding habitats: the breeding ecology of the wood pigeon *Columba palumbus* in urban areas of north-west Poland’, *Acta Zoologica Lituanica*, vol. 8, no. 1, pp. 137-143 |
| Date of first egg laying | 30 April (22 February - 20 August) | BTO <https://www.bto.org/> |
| Peak of egg-laying period late July | Murton R.K. and Isaacson A.J. (2008) ‘The functional basis of some behavior in the woodpigeon *Columba palumbus*’, *Ibis*, vol. 104, no. 4, pp. 503-521 |
| Number of broods per year | 1-2 | BTO <https://www.bto.org/> |
| Number of broods and breeding attempts per pair per year | 2.5-3.6 | Górski W. et al. (1998) ‘Survey and monitoring of breeding habitats: the breeding ecology of the wood pigeon *Columba palumbus* in urban areas of north-west Poland’, *Acta Zoologica Lituanica*, vol. 8, no. 1, pp. 137-143 |
| Number of eggs laid per nest | 2 | BTO <https://www.bto.org/> |
| 2 | Murton R.K. and Isaacson A.J. (2008) ‘The functional basis of some behavior in the woodpigeon *Columba palumbus*’, *Ibis*, vol. 104, no. 4, pp. 503-521 |
| Incubation period | 17 days | BTO <https://www.bto.org/> |
| Hatching success | 73.6% | Slater P. (2001) ‘Breeding ecology of a suburban population of Woodpigeons *Columba palumbus* in northwest England’, *Bird study*, vol. 48, no. 3, pp.361-366 |
| Breeding success | 38-44% | Górski W. et al. (1998) ‘Survey and monitoring of breeding habitats: the breeding ecology of the wood pigeon *Columba palumbus* in urban areas of north-west Poland’, *Acta Zoologica Lituanica*, vol. 8, no. 1, pp. 137-143 |
| Broods size | 1.75-1.82 | Górski W. et al. (1998) ‘Survey and monitoring of breeding habitats: the breeding ecology of the wood pigeon *Columba palumbus* in urban areas of north-west Poland’, *Acta Zoologica Lituanica*, vol. 8, no. 1, pp. 137-143 |
| Fledging period | 33-34 giorni | BTO <https://www.bto.org/> |
| Fledging success | 59.7% from eggs laid  81.2% from eggs hatched | Slater P. (2001) ‘Breeding ecology of a suburban population of Woodpigeons *Columba palumbus* in northwest England’, *Bird study*, vol. 48, no. 3, pp.361-366 |
| 84-98% | Murton R.K. et al. (2008) ‘Factors affecting egg-weight, body-weight and moult of the woodpigeon *Columba* *palumbus*’, *Ibis*, vol. 116, no. 1, pp. 52-73 |
| Number of fledglings per breeding attempt | 0.68-0.77 | Górski W. et al. (1998) ‘Survey and monitoring of breeding habitats: the breeding ecology of the wood pigeon *Columba palumbus* in urban areas of north-west Poland’, *Acta Zoologica Lituanica*, vol. 8, no. 1, pp. 137-143 |
| Mean number of fledglings per pair per year | 1.7-2.7 | Górski W. et al. (1998) ‘Survey and monitoring of breeding habitats: the breeding ecology of the wood pigeon *Columba palumbus* in urban areas of north-west Poland’, *Acta Zoologica Lituanica*, vol. 8, no. 1, pp. 137-143 |
| Juvenile survival | 0.520 | BTO <https://www.bto.org/> |
| Adult survival | 0.607 ± 0.016 | BTO <https://www.bto.org/> |
| Mean life | 3 years | BTO <https://www.bto.org/> |
| Age at first breeding | 1 | BTO <https://www.bto.org/> |
| Birds size | Length 41cm  Wingspan 78cm  Weight 450g | BTO <https://www.bto.org/> |
| Egg size | Length 41mm  Width 29mm  Weight 18.9g (% of shell 7) | BTO <https://www.bto.org/> |
| Nest height above the ground | Majority between 5 and 10m  (14.3% between 0- 5m,  53.7% between 5-10m,  22.8% between 10-15m,  8.5% between 15-20m,  0.7% between 20-25m) | Slater P. (2001) ‘Breeding ecology of a suburban population of Woodpigeons *Columba palumbus* in northwest England’, *Bird study*, vol. 48, no. 3, pp.361-366 |
| 7.1 (average) ± 3.3m (SD)  2.2-19m (range) | Sakhvon V. and Kövér L. (2020) ‘Distribution and habitat preferences of the urban Woodpigeon (*Columba palumbus*) in the north-eastern breeding range in Belarus’, *Landscape and Urban Planning*, vol. 201, pp. 1-7 |

# Mallard (*Anas platyrhynchos*)

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| --- | --- | --- |
| **Parameter** | **Data** | **Reference** |
| Population | 301 individuals detected during the breeding season in Lombardy region | Brambilla M, Calvi G. and Vitulano S. (2021) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Habitat | Agro-ecosystems | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Population distribution in Lombardy region | 0% coniferous forests  5% in high plain  50% arable land  3% broadleaved woods  37% rice plain  0% Alps  4% urban plain | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Annual Growth Rate | 5.559 | Brambilla M, Calvi G. and Vitulano S. (2021) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Migratory strategy | Partially migrant / short range | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Breeding season | 1 April – 15 July | Brambilla M, Calvi G. and Vitulano S. (2021) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Date of first egg laying | Earliest: beginning of April  Latest: beginning of June | Batt B.D.J and Prince H. (1979) ‘Laying Dates, Clutch Size and Egg Weight of Captive Mallards’, *The Condor*, vol. 81, no. 1, pp. 35-41 |
| From 6 April to 29 June (mean 3 May) in north-Dakota | Krapu G.L. et al. (1983) ‘The Effect of Variable Spring Water Conditions on Mallard Reproduction’, *The Auk*, vol. 100, no. 3, pp. 689-698 |
| End of January – end of May | Amat J.A. (1982) ‘The nesting biology of ducks in the Marismas of the Guadalquivir, south-western Spain’, *Wildfowl*, vol. 33, pp. 94-104 |
| Number of broods per year | 1 | BTO <https://www.bto.org/> |
| Number of eggs laid per nest | 11-14 | BTO <https://www.bto.org/> |
| 10.4 – 9.5 – 8.4 – 8.2 | Batt B.D.J and Prince H. (1979) ‘Laying Dates, Clutch Size and Egg Weight of Captive Mallards’, *The Condor*, vol. 81, no. 1, pp. 35-41 |
| 5-16 (modal 10)  Mean: 8.4 ± 1.9 | Fouzari A. et al. (2018) ‘The breeding ecology of Mallard *Anas platyrhynchos* at Lake Tonga, north-eastern Algeria’, *Ostrich*, vol. 89, no. 4, pp. 315-320 |
| 8.5-8.9-8.2-8.3 | McLandress M.R. et al. (1996) ‘Nesting Biology of Mallards in California’, *The Journal of Wildlife Management*, vol. 60, no. 1, pp. 94-107 |
| Mean 9.1 ± 0.1 (modal 9) | Devries J.H. et al. (2008) ‘Effects of spring body condition and age on reproduction in mallards (*Anas platyrhynchos*)’, *The Auk*, vol. 125, no. 3, pp. 618-628 |
| Incubation period | 27-28 days | BTO <https://www.bto.org/> |
| Hatching success | 67% | Finch B.E. et al. (2011) ‘Embryotoxicity of weathered crude oil from the Gulf of Mexico in mallard ducks (Anas platyrhynchos)’, *Environmental Toxicology and Chemistry*, vol. 30, no. 8, pp. 1885-1891 |
| Overall nesting success | 53.7% | Fouzari A. et al. (2018) ‘The breeding ecology of Mallard *Anas platyrhynchos* at Lake Tonga, north-eastern Algeria’, *Ostrich*, vol. 89, no. 4, pp. 315-320 |
| Fledging period | 50-60 days | BTO <https://www.bto.org/> |
| Juvenile survival | 0.518 (in first year) | BTO <https://www.bto.org/> |
| Adult survival | 0.627 (mean) (Male:0.679 ± 0.011; Female:0.575 ± 0.021) | BTO <https://www.bto.org/> |
| Mean life | 3 years | BTO <https://www.bto.org/> |
| Age at first breeding | 1 | BTO <https://www.bto.org/> |
| Birds size | Length 58cm  Wingspan 90cm  Weight 1100g | BTO <https://www.bto.org/> |
| Egg size | Length 57mm  Width 41mm  Weight 54g (% of shell 8) | BTO <https://www.bto.org/> |
| Nest height above the ground | 0m | <https://www.monaconatureencyclopedia.com/anas-platyrhynchos/> |
| 0m | Fouzari A. et al. (2018) ‘The breeding ecology of Mallard *Anas platyrhynchos* at Lake Tonga, north-eastern Algeria’, *Ostrich*, vol. 89, no. 4, pp. 315-320 |

# Lapwing (*Vanellus vanellus*)

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| --- | --- | --- |
| **Parameter** | **Data** | **Reference** |
| Population | 112 individuals detected during breeding season in Lombardy region | Brambilla M, Calvi G. and Vitulano S. (2021) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Habitat | Agro-ecosystems | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Population distribution in Lombardy region | 0% coniferous forests  0% in high plain  26% arable land  0% broadleaved woods  71% rice plain  0% Alps  2% urban plain | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Annual Growth Rate | 7.329 | Brambilla M, Calvi G. and Vitulano S. (2021) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Migratory strategy | Partially migrant / short range | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Breeding season | 15 March – 15 July | Brambilla M, Calvi G. and Vitulano S. (2021) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Date of first egg laying | 12 April (25 March - 25 May) | BTO <https://www.bto.org/> |
| From the end of March to the end of May | Galbraith H. (1988) ‘Effects of Agriculture on the Breeding Ecology of Lapwings Vanellus vanellus’, *The Journal of Applied Ecology*, vol. 25, no. 2, pp. 487-503 |
| Hatching date | 25 days after clutch completion | Galbraith H. (1988) ‘Effects of Agriculture on the Breeding Ecology of Lapwings Vanellus vanellus’, *The Journal of Applied Ecology*, vol. 25, no. 2, pp. 487-503 |
| Number of broods per year | 1 | BTO <https://www.bto.org/> |
| Number of eggs laid per nest | 4 eggs | 3.76 (mean) ± 0.54 (SD) (2 min – 5 max) | BTO <https://www.bto.org/> |
| 4 | Galbraith H. (1988) ‘Effects of egg size and composition on the size, quality and survival of lapwing Vanellus vanellus chicks’, *Journal of Zoology*, vol. 214, no. 3, pp. 383-398 |
| Modal 4 (in 78% of clutches) | Galbraith H. (1988) ‘Effects of Agriculture on the Breeding Ecology of Lapwings Vanellus vanellus’, *The Journal of Applied Ecology*, vol. 25, no. 2, pp. 487-503 |
| Incubation period | 25-34 days | BTO <https://www.bto.org/> |
| 21-28 days (mean 25.2) | Galbraith H. (1988) ‘Effects of egg size and composition on the size, quality and survival of lapwing Vanellus vanellus chicks’, *Journal of Zoology*, vol. 214, no. 3, pp. 383-398 |
| 25 days | Galbraith H. (1988) ‘Effects of Agriculture on the Breeding Ecology of Lapwings Vanellus vanellus’, *The Journal of Applied Ecology*, vol. 25, no. 2, pp. 487-503 |
| Fledging period | 35 -40 days | BTO <https://www.bto.org/> |
| 35 days | Galbraith H. (1988) ‘Effects of egg size and composition on the size, quality and survival of lapwing Vanellus vanellus chicks’, *Journal of Zoology*, vol. 214, no. 3, pp. 383-398 |
| Fledging success | About 30% | Galbraith H. (1988) ‘Effects of egg size and composition on the size, quality and survival of lapwing Vanellus vanellus chicks’, *Journal of Zoology*, vol. 214, no. 3, pp. 383-398 |
| Juvenile survival | 0.595 (in first year) | BTO <https://www.bto.org/> |
| Juvenile mortality | 44% in first year | Galbraith H. (1988) ‘Effects of Agriculture on the Breeding Ecology of Lapwings Vanellus vanellus’, *The Journal of Applied Ecology*, vol. 25, no. 2, pp. 487-503 |
| Adult survival | 0.705 ± 0.031 | BTO <https://www.bto.org/> |
| Adult mortality | 33% | Galbraith H. (1988) ‘Effects of Agriculture on the Breeding Ecology of Lapwings Vanellus vanellus’, *The Journal of Applied Ecology*, vol. 25, no. 2, pp. 487-503 |
| Mean life | 5 years | BTO <https://www.bto.org/> |
| Age at first breeding | 2 | BTO <https://www.bto.org/> |
| Birds size | Length 30cm  Wingspan 84cm  Weight 230g | BTO <https://www.bto.org/> |
| Egg size | Length 47mm  Width 33mm  Weight 26g (% of shell 6) | BTO <https://www.bto.org/> |
| Nest height above the ground | 0m | <https://www.monaconatureencyclopedia.com/vanellus-vanellus/#:~:text=Il%20nido%20della%20pavoncella%20%C3%A8,maschio%20ed%20ultimato%20dalla%20femmina>. |

# Great spotted woodpecker (*Dendrocopos major*)

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| **Parameter** | **Data** | **Reference** |
| Population | 131 individuals detected during the breeding season in Lombardy region | Brambilla M, Calvi G. and Vitulano S. (2021) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Habitat | Forests / shrumps | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Population distribution in Lombardy region | 10% coniferous forests  21% in high plain  24% arable land  29% broadleaved woods  8% rice plain  1% Alps  7% urban plain | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Annual Growth Rate | 3.292 | Brambilla M, Calvi G. and Vitulano S. (2021) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Migratory strategy | Resident | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Breeding season | 10 March – 30 June | Brambilla M, Calvi G. and Vitulano S. (2021) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Date of first egg laying | 4 May (16 April - 22 May) | BTO <https://www.bto.org/> |
| 26 April – 6 May (period in which the majority of couples have started the laying) | Mazgajski T. and Rejt L. (2006) ‘The effect of forest patch size on the breeding biology of the great spotted woodpecker *Dendrocopos major*’, *Annales Zoologici Fennici*, vol. 43, no. 2, pp. 211.220 |
| Earliest: 20 April  Latest: 24 May  Majority of nests started between 26 and 30 April  Median laying date = 30 April (range 27/28 April – 2/3 May) | Kosinski Z. and Ksit P. (2006) ‘Comparative reproductive biology of Middle Spotted Woodpeckers *Dendrocopos medius* and Great Spotted Woodpeckers *D. major* in a riverine forest’, *Bird Study*, vol. 53, no. 3, pp. 237-246 |
| Number of broods per year | 1 | BTO <https://www.bto.org/> |
| Number of eggs laid per nest | 4 - 6 eggs | 5.28 (mean) ± 1.49 (SD) (2 min – 9 max) | BTO <https://www.bto.org/> |
| 6.5 (mean) ± 0.89 (SD) large forests  5.69 (mean) ± 0.85 (SD) small forests | Mazgajski T. and Rejt L. (2006) ‘The effect of forest patch size on the breeding biology of the great spotted woodpecker *Dendrocopos major*’, *Annales Zoologici Fennici*, vol. 43, no. 2, pp. 211.220 |
| 5.4 +/- 1.2  Modal: 5  Min 3 max 8 | Kosinski Z. and Ksit P. (2006) ‘Comparative reproductive biology of Middle Spotted Woodpeckers *Dendrocopos medius* and Great Spotted Woodpeckers *D. major* in a riverine forest’, *Bird Study*, vol. 53, no. 3, pp. 237-246 |
| Incubation period | 14 - 16 days | 14.32 (mean) ± 2.10 (SD) (10.5 min – 17 max) | BTO <https://www.bto.org/> |
| About 12 days | Kosinski Z. and Ksit P. (2006) ‘Comparative reproductive biology of Middle Spotted Woodpeckers *Dendrocopos medius* and Great Spotted Woodpeckers *D. major* in a riverine forest’, *Bird Study*, vol. 53, no. 3, pp. 237-246 |
| Hatching success | 75%  85% excluding nests that failed completely | Kosinski Z. and Ksit P. (2006) ‘Comparative reproductive biology of Middle Spotted Woodpeckers *Dendrocopos medius* and Great Spotted Woodpeckers *D. major* in a riverine forest’, *Bird Study*, vol. 53, no. 3, pp. 237-246 |
| Number of hatched nestlings | 4.2 (mean) ± 1.6 (DS)  4.7 (mean) ± 0.8 (DS) excluding failed nests | Kosinski Z. and Ksit P. (2006) ‘Comparative reproductive biology of Middle Spotted Woodpeckers *Dendrocopos medius* and Great Spotted Woodpeckers *D. major* in a riverine forest’, *Bird Study*, vol. 53, no. 3, pp. 237-246 |
| Brood size | 3.3 (mean) ± 1.7 (DS)  4.0 ± 0.8 excluding failed nests | Kosinski Z. and Ksit P. (2006) ‘Comparative reproductive biology of Middle Spotted Woodpeckers *Dendrocopos medius* and Great Spotted Woodpeckers *D. major* in a riverine forest’, *Bird Study*, vol. 53, no. 3, pp. 237-246 |
| Fledging period | 20 - 24 days | 22.30 (mean) ± 2.91 (SD) (18 min - 27.5 max) | BTO <https://www.bto.org/> |
| 15-18 days | Kosinski Z. and Ksit P. (2006) ‘Comparative reproductive biology of Middle Spotted Woodpeckers *Dendrocopos medius* and Great Spotted Woodpeckers *D. major* in a riverine forest’, *Bird Study*, vol. 53, no. 3, pp. 237-246 |
| Fledging date | 28 May - 16 june | Kosinski Z. and Ksit P. (2006) ‘Comparative reproductive biology of Middle Spotted Woodpeckers *Dendrocopos medius* and Great Spotted Woodpeckers *D. major* in a riverine forest’, *Bird Study*, vol. 53, no. 3, pp. 237-246 |
| Number of fledglings per brood | 4.48 (mean) ± 1.03 (SD) large forests  3.92 (mean) ± 0.77 (SD) small forests | Mazgajski T. and Rejt L. (2006) ‘The effect of forest patch size on the breeding biology of the great spotted woodpecker *Dendrocopos major*’, *Annales Zoologici Fennici*, vol. 43, no. 2, pp. 211.220 |
| Nestling period | 54-56 days | Kosinski Z. and Ksit P. (2006) ‘Comparative reproductive biology of Middle Spotted Woodpeckers *Dendrocopos medius* and Great Spotted Woodpeckers *D. major* in a riverine forest’, *Bird Study*, vol. 53, no. 3, pp. 237-246 |
| Daily nest survival rate | 99.5% | Kosinski Z. and Ksit P. (2006) ‘Comparative reproductive biology of Middle Spotted Woodpeckers *Dendrocopos medius* and Great Spotted Woodpeckers *D. major* in a riverine forest’, *Bird Study*, vol. 53, no. 3, pp. 237-246 |
| Survival probabilities estimated | 76.9% | Kosinski Z. and Ksit P. (2006) ‘Comparative reproductive biology of Middle Spotted Woodpeckers *Dendrocopos medius* and Great Spotted Woodpeckers *D. major* in a riverine forest’, *Bird Study*, vol. 53, no. 3, pp. 237-246 |
| Breeding success | 84.6% large forests  83.3% small forests | Mazgajski T. and Rejt L. (2006) ‘The effect of forest patch size on the breeding biology of the great spotted woodpecker *Dendrocopos major*’, *Annales Zoologici Fennici*, vol. 43, no. 2, pp. 211.220 |
| Percentage of nests that fledged at least one chick | 88.5% | Kosinski Z. and Ksit P. (2006) ‘Comparative reproductive biology of Middle Spotted Woodpeckers *Dendrocopos medius* and Great Spotted Woodpeckers *D. major* in a riverine forest’, *Bird Study*, vol. 53, no. 3, pp. 237-246 |
| % of young that survived till fledging | 51.8%  72.7% excluding failed nests | Kosinski Z. and Ksit P. (2006) ‘Comparative reproductive biology of Middle Spotted Woodpeckers *Dendrocopos medius* and Great Spotted Woodpeckers *D. major* in a riverine forest’, *Bird Study*, vol. 53, no. 3, pp. 237-246 |
| Birds size | Length 22cm  Wingspan 36cm  Weight 85g | BTO <https://www.bto.org/> |
| Egg size | Length 27 mm  Width 20mm  Weight 5.7g (% of shell 7) | BTO <https://www.bto.org/> |
| Nest height above the ground | 0.5-19m (range)  75% between 1 and 7m  4.8m on average | Hebda G. (2009) ‘Nesting sites of the Great Spotted Woodpecker Dendrocopos major L. in Poland: analysis of nest cards’, *Polish Journal of Ecology*, vol. 57, no. 1, pp. 149-158 |
| 7.75m (mean) ± 3.76 (SD)  1.80-16m (range) | Ćiković D. (2014) ‘Nest Site and Nest-Hole Characteristics Used by Great Spotted Woodpecker Dendrocopos major L. in Croatia’, *Polish Journal of Ecology*, vol. 62, no. 2, pp. 349-360 |

# Gray heron (*Ardea cinerea*)

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| **Parameter** | **Data** | **Reference** |
| Population | 163 individuals detected during the breeding season in Lombardy region | Brambilla M, Calvi G. and Vitulano S. (2021) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Habitat | Agro-ecosystems | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Population distribution in Lombardy region | 0% coniferous forests  3% in high plain  57% arable land  1% broadleaved woods  35% rice plain  0% Alps  4% urban plain | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Annual Growth Rate | 0.1 | Brambilla M, Calvi G. and Vitulano S. (2021) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Migratory strategy | Partially migrant / short range | Bani L. and Orioli V. (2016) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| Breeding season | 19 February – 2 May | Brambilla M, Calvi G. and Vitulano S. (2021) ‘Monitoraggio dell’avifauna nidificante in Lombardia’, *Regione Lombardia* |
| From mid-February to the end of May | Campos F. and Fernandez-Cruz M (1991) ‘The Breeding Biology of the Grey Heron (*Ardea cinerea*) in the Duero River Basin in Spain’, *Colonial Waterbirds*, vol. 14, no. 1, pp. 57-60 |
| Length of the breeding season | about 100-110 days (from the start of laying to fledging) | Van Vessem J. and Draulans D. (1986) ‘Factors affecting the length of the breeding cycle and the frequency of nest attendance by Grey Herons *Ardea cinerea*’, *Bird Study*, vol. 33, no. 2, pp. 98-104 |
| Date of first egg laying | 12 March (19 February - 2 May) | BTO <https://www.bto.org/> |
| From first weeks of February until start of June (peak in the last week of March and first week of April)  Mean date 2 April | Van Vessem J. and Draulans D. (1986) ‘The Adaptive Significance of Colonial Breeding in the Grey Heron Ardea cinerea: Inter- and Intra-Colony Variability in Breeding Success’, *Ornis Scandinavica*, vol. 17, no. 4, pp. 356-362 |
| Two peaks of laying: first half of March and end of April/beginning of May | Campos F. and Fernandez-Cruz M (1991) ‘The Breeding Biology of the Grey Heron (*Ardea cinerea*) in the Duero River Basin in Spain’, *Colonial Waterbirds*, vol. 14, no. 1, pp. 57-60 |
| Laying start at the beginning of March.  Majority of nests started 11 March and 9 April | Owen D.F. (1960) ‘The nesting success of the heron *Ardea* *cinerea* in relation to the availability of food’, *Proceedings of the Zoological Society of London*, vol. 133, no. 4, pp. 197-617 |
| Laying period | 13.1 (mean) ± 7.0 (SD) (5 min – 29 max) | Van Vessem J. and Draulans D. (1986) ‘Factors affecting the length of the breeding cycle and the frequency of nest attendance by Grey Herons *Ardea cinerea*’, *Bird Study*, vol. 33, no. 2, pp. 98-104 |
| Hatching date | Earliest: second half of March | Campos F. and Fernandez-Cruz M (1991) ‘The Breeding Biology of the Grey Heron (*Ardea cinerea*) in the Duero River Basin in Spain’, *Colonial Waterbirds*, vol. 14, no. 1, pp. 57-60 |
| Number of broods per year | 1 (2) | BTO <https://www.bto.org/> |
| Number of eggs laid per nest | 3 - 4 eggs | 3.66 (mean) ± 1.06 (SD) (2 min – 7 max) | BTO <https://www.bto.org/> |
| 3.6 (mean) ± 0.8 (SD)  (range 3.1-3.9) | Van Vessem J. and Draulans D. (1986) ‘The Adaptive Significance of Colonial Breeding in the Grey Heron Ardea cinerea: Inter- and Intra-Colony Variability in Breeding Success’, *Ornis Scandinavica*, vol. 17, no. 4, pp. 356-362 |
| 3-6 (min 2)  Mean: 3-8-4.1 | Owen D.F. (1960) ‘The nesting success of the heron *Ardea* *cinerea* in relation to the availability of food’, *Proceedings of the Zoological Society of London*, vol. 133, no. 4, pp. 197-617 |
| number of young raised per brood | 2-3.8 | Owen D.F. (1960) ‘The nesting success of the heron *Ardea* *cinerea* in relation to the availability of food’, *Proceedings of the Zoological Society of London*, vol. 133, no. 4, pp. 197-617 |
| Incubation period | 26 - 27 days | 26.95 (mean) ± 0.90 (SD) (26.5 min - 28.5 max) | BTO <https://www.bto.org/> |
| 28.5 (media) ± 3.2 (DS) (25 min- 37 max) | Van Vessem J. and Draulans D. (1986) ‘Factors affecting the length of the breeding cycle and the frequency of nest attendance by Grey Herons *Ardea cinerea*’, *Bird Study*, vol. 33, no. 2, pp. 98-104 |
| Hatching success | 17% fail to hatch | Van Vessem J. and Draulans D. (1986) ‘The Adaptive Significance of Colonial Breeding in the Grey Heron Ardea cinerea: Inter- and Intra-Colony Variability in Breeding Success’, *Ornis Scandinavica*, vol. 17, no. 4, pp. 356-362 |
| 31.5% fail to hatch | Campos F. and Fernandez-Cruz M (1991) ‘The Breeding Biology of the Grey Heron (*Ardea cinerea*) in the Duero River Basin in Spain’, *Colonial Waterbirds*, vol. 14, no. 1, pp. 57-60 |
| Fledging period | 50 - 55 days | 52.87 (mean) ± 2.62 (SD) (50 min – 55 max) | BTO <https://www.bto.org/> |
| Age at which nestlings flege | 39-51 days old | Jakubas D. (2005) ‘Factors affecting the breeding success of the grey heron (*Ardea cinerea*) in northern Poland’, *Journal of Ornithology*, vol. 146, no. 1, pp. 27-33 |
| Fledging date | 35.6% able to fly by the first half of June | Campos F. and Fernandez-Cruz M (1991) ‘The Breeding Biology of the Grey Heron (*Ardea cinerea*) in the Duero River Basin in Spain’, *Colonial Waterbirds*, vol. 14, no. 1, pp. 57-60 |
| Parental feeding after fledge | 5 days | Van Vessem J. and Draulans D. (1986) ‘Factors affecting the length of the breeding cycle and the frequency of nest attendance by Grey Herons *Ardea cinerea*’, *Bird Study*, vol. 33, no. 2, pp. 98-104 |
| Chick rearing | 55.1 (media) ± 6.5 (DS) (43 min – 66 max) | Van Vessem J. and Draulans D. (1986) ‘Factors affecting the length of the breeding cycle and the frequency of nest attendance by Grey Herons *Ardea cinerea*’, *Bird Study*, vol. 33, no. 2, pp. 98-104 |
| Average number of nestlings per brood | 21-27 days old: 3.4-3.7 (SD: 0.72-0.79)  28-38 days old: 3.0-3.4 (SD: 0.8-1.07)  39-51 days old: 2.5-3.2 (SD: 0.91-1.20) | Van Vessem J. and Draulans D. (1986) ‘Factors affecting the length of the breeding cycle and the frequency of nest attendance by Grey Herons *Ardea cinerea*’, *Bird Study*, vol. 33, no. 2, pp. 98-104 |
| Small chicks 3.4 (mean) ± 0.8 (SD)  Large chicks 2.8 (mean) ± 0.9 (SD) | Van Vessem J. and Draulans D. (1986) ‘The Adaptive Significance of Colonial Breeding in the Grey Heron Ardea cinerea: Inter- and Intra-Colony Variability in Breeding Success’, *Ornis Scandinavica*, vol. 17, no. 4, pp. 356-362 |
| Nestling period | From April to the end of June | Jakubas D. (2005) ‘Factors affecting the breeding success of the grey heron (*Ardea cinerea*) in northern Poland’, *Journal of Ornithology*, vol. 146, no. 1, pp. 27-33 |
| Juvenile mortality rate | 0-2 weeks: 18%  2-4 weeks: 42%  4-6 weeks: 32%  >6 weeks: 8% | Van Vessem J. and Draulans D. (1986) ‘The Adaptive Significance of Colonial Breeding in the Grey Heron Ardea cinerea: Inter- and Intra-Colony Variability in Breeding Success’, *Ornis Scandinavica*, vol. 17, no. 4, pp. 356-362 |
| Juvenile survival | 0.260 (to age 2 ) | BTO <https://www.bto.org/> |
| Adult survival | 0.732 ± 0.018 | BTO <https://www.bto.org/> |
| Daily nest survival rate | 2-46% | Owen D.F. (1960) ‘The nesting success of the heron *Ardea* *cinerea* in relation to the availability of food’, *Proceedings of the Zoological Society of London*, vol. 133, no. 4, pp. 197-617 |
| Mean life | 5 years | BTO <https://www.bto.org/> |
| Age at first breeding | 2 | BTO <https://www.bto.org/> |
| Birds size | Length 94cm  Wingspan 185cm  Weight 1500g | BTO <https://www.bto.org/> |
| Egg size | Length 61mm  Width 43mm  Weight 61g (% of shell 8) | BTO <https://www.bto.org/> |
| Nest height above the ground | 20.02-27m | Fasola M. and Alieri R. (1992) ‘Nest Site Characteristics in Relation to Body Size in Herons in Italy’, *Colonial Waterbirds*, vol. 15, no. 2, pp. 185-191 |