

## Supplementary Information as referred to in

### Costs and benefits of social connectivity in juvenile Greylag geese

Georgine Szipl, Marie Depenau, Kurt Kotrschal, Josef Hemetsberger, Didone Frigerio

**Table S1.** Coefficients of the linear regression investigating breeding success (yes/no), with estimated means (EM), standard errors (SE), z values and significance levels (p), separately for juveniles, and 2- and 3-year olds.

|                                      | EM      | SE     | z value | p     |
|--------------------------------------|---------|--------|---------|-------|
| <b>Juveniles</b>                     |         |        |         |       |
| (Intercept)                          | -10.244 | 10.015 | -1.02   | 0.306 |
| Social connectivity                  | 10.359  | 10.283 | 1.01    | 0.314 |
| Season (mating) <sup>a</sup>         | 9.731   | 10.798 | 0.90    | 0.367 |
| Season (breeding) <sup>a</sup>       | 11.006  | 10.265 | 1.07    | 0.284 |
| Social connectivity:Season(mating)   | -10.266 | 10.831 | -0.95   | 0.343 |
| Social connectivity:Season(breeding) | -12.143 | 11.297 | -1.08   | 0.282 |
| <b>2-year olds</b>                   |         |        |         |       |
| (Intercept)                          | 0.432   | 2.575  | 0.17    | 0.867 |
| Social connectivity                  | -0.942  | 2.825  | -0.33   | 0.739 |
| Season (mating) <sup>a</sup>         | -0.397  | 3.315  | -0.12   | 0.905 |
| Season (breeding) <sup>a</sup>       | -2.961  | 3.834  | -0.77   | 0.440 |
| Social connectivity:Season(mating)   | 0.205   | 4.373  | 0.05    | 0.963 |
| Social connectivity:Season(breeding) | 4.294   | 4.937  | 0.87    | 0.384 |
| <b>3-year olds</b>                   |         |        |         |       |
| (Intercept)                          | 0.593   | 2.018  | 0.29    | 0.769 |
| Social connectivity                  | -1.402  | 2.351  | -0.60   | 0.551 |
| Season (mating) <sup>a</sup>         | 2.183   | 3.388  | 0.64    | 0.519 |
| Season (breeding) <sup>a</sup>       | -1.371  | 2.416  | -0.57   | 0.571 |
| Social connectivity:Season(mating)   | -3.364  | 4.456  | -0.76   | 0.450 |
| Social connectivity:Season(breeding) | 1.749   | 2.989  | 0.59    | 0.558 |
| Set as reference point:              |         |        |         |       |
| <sup>a</sup> : Season (winter flock) |         |        |         |       |
| “.” denote interactions              |         |        |         |       |

**Table S2.** List of the 44 focal individuals including year of hatching, sex, information on the relatedness (i.e. the mother), and their pair partner.

| <b>Name</b>   | <b>Year of hatching</b> | <b>Sex</b> | <b>Mother</b> | <b>Partner</b>     |
|---------------|-------------------------|------------|---------------|--------------------|
| Kaikos        | 2013                    | female     | Kleine Hexe   | JayLo (2013)       |
| Kiribati      | 2013                    | male       | Kleine Hexe   | Iris (2014)        |
| Bonsai        | 2013                    | female     | Baggins       |                    |
| Lacrima       | 2013                    | female     | Leviathan     | Brooklyn (2012)    |
| Lenka         | 2013                    | female     | Leviathan     | Sinclair (2008)    |
| Levuka        | 2013                    | male       | Lando         |                    |
| Dädalus       | 2013                    | male       | Duftspur      | Langschweif (2014) |
| Dardanos      | 2013                    | female     | Duftspur      | Jager (2012)       |
| Taras         | 2013                    | male       | Timber        | Ibis (2014)        |
| Timo          | 2013                    | male       | Timber        | Icecream (2014)    |
| Thalia        | 2013                    | female     | Timber        | Lamborghini (2012) |
| Joe           | 2013                    | male       | Judith        | Bettina (2014)     |
| JayLo         | 2013                    | male       | Judith        | Kaikos (2013)      |
| Inti          | 2013                    | male       | Ingeborg      | Jamila (2014)      |
| Kokosnuss     | 2014                    | male       | Kleine Hexe   |                    |
| Lennox        | 2014                    | male       | Lando         |                    |
| Lona          | 2014                    | female     | Leviathan     |                    |
| Trevor        | 2014                    | female     | Timber        |                    |
| Jurek         | 2014                    | male       | Judith        |                    |
| Jessica       | 2014                    | female     | Judith        | Bloody Mary (2012) |
| Icecream      | 2014                    | female     | Ingeborg      | Timo (2013)        |
| Ingwer        | 2014                    | male       | Ingeborg      |                    |
| Langschweif   | 2014                    | female     | Löwenherz     | Dädalus (2013)     |
| Lawrence      | 2014                    | male       | Löwenherz     |                    |
| Berta         | 2014                    | female     | Barbados      |                    |
| Bosse         | 2014                    | male       | Barbados      | Hermine (2014)     |
| Halleluja     | 2014                    | male       | Longshanks    |                    |
| Hermine       | 2014                    | female     | Longshanks    | Bosse (2014)       |
| John          | 2014                    | male       | Jewel         |                    |
| Kolumbien     | 2015                    | female     | Kleine Hexe   |                    |
| Kirgistan     | 2015                    | male       | Kleine Hexe   |                    |
| Lavender      | 2015                    | female     | Leviathan     |                    |
| Lederblümchen | 2015                    | male       | Leviathan     |                    |
| Locke´s       | 2015                    | female     | Löwenherz     |                    |
| Longmorn      | 2015                    | male       | Löwenherz     |                    |
| Ismail        | 2015                    | female     | Ingeborg      |                    |
| Banane        | 2015                    | female     | Barbados      |                    |
| Blaubeere     | 2015                    | male       | Barbados      |                    |
| Hedwig        | 2015                    | male       | Longshanks    |                    |
| Jongsong      | 2015                    | female     | Jewel         |                    |

|           |      |        |          |  |
|-----------|------|--------|----------|--|
| GlenGrant | 2015 | male   | Ginny    |  |
| Diamante  | 2015 | female | Duftspur |  |
| Demant    | 2015 | male   | Duftspur |  |
| Benromach | 2015 | male   | Baggins  |  |

**Table S3.** Summary of focal observations and collected droppings per focal individual per season.

| Focal individual | Number of focal observations |          |          | Sum | Mean | SD   | Number of droppings |          |          | Sum | Mean  | SD   |
|------------------|------------------------------|----------|----------|-----|------|------|---------------------|----------|----------|-----|-------|------|
|                  | Season 1                     | Season 2 | Season 3 |     |      |      | Season 1            | Season 2 | Season 3 |     |       |      |
| Banane           | 8                            | 5        | 4        | 17  | 5.67 | 1.70 | 16                  | 15       | 15       | 46  | 15.33 | 0.47 |
| Benromach        | 8                            | 3        | 6        | 17  | 5.67 | 2.05 | 18                  | 14       | 13       | 45  | 15.00 | 2.16 |
| Berta            | 9                            | 4        | 6        | 19  | 6.33 | 2.05 | 16                  | 15       | 9        | 40  | 13.33 | 3.09 |
| Blaubeere        | 8                            | 5        | 2        | 15  | 5.00 | 2.45 | 19                  | 14       | 14       | 47  | 15.67 | 2.36 |
| Bonsai           | 8                            | 5        | 7        | 20  | 6.67 | 1.25 | 16                  | 13       | 10       | 39  | 13.00 | 2.45 |
| Bosse            | 9                            | 5        | 4        | 18  | 6.00 | 2.16 | 18                  | 12       | 10       | 40  | 13.33 | 3.40 |
| Daedalus         | 9                            | 4        | 7        | 20  | 6.67 | 2.05 | 16                  | 12       | 6        | 34  | 11.33 | 4.11 |
| Dardanos         | 8                            | 5        | 1        | 14  | 4.67 | 2.87 | 20                  | 18       | 5        | 43  | 14.33 | 6.65 |
| Demant           | 8                            | 6        | 6        | 20  | 6.67 | 0.94 | 15                  | 14       | 7        | 36  | 12.00 | 3.56 |
| Diamante         | 8                            | 5        | NA       | 13  | 6.50 | 1.50 | 17                  | 12       | NA       | 29  | 14.50 | 2.50 |
| GlenGrant        | 8                            | 4        | 5        | 17  | 5.67 | 1.70 | 19                  | 12       | 11       | 42  | 14.00 | 3.56 |
| Halleluja        | 9                            | 5        | 5        | 19  | 6.33 | 1.89 | 15                  | 12       | 9        | 36  | 12.00 | 2.45 |
| Hedwig           | 8                            | 4        | 3        | 15  | 5.00 | 2.16 | 16                  | 14       | 10       | 40  | 13.33 | 2.49 |
| Hermine          | 9                            | 5        | 4        | 18  | 6.00 | 2.16 | 15                  | 11       | 9        | 35  | 11.67 | 2.49 |
| Icecream         | 9                            | 4        | 2        | 15  | 5.00 | 2.94 | 14                  | 14       | 11       | 39  | 13.00 | 1.41 |
| Ingwer           | 9                            | 5        | 8        | 22  | 7.33 | 1.70 | 18                  | 13       | 8        | 39  | 13.00 | 4.08 |
| Inti             | 8                            | 5        | 4        | 17  | 5.67 | 1.70 | 19                  | 14       | 5        | 38  | 12.67 | 5.79 |
| Ismail           | 8                            | 5        | 4        | 17  | 5.67 | 1.70 | 16                  | 12       | 11       | 39  | 13.00 | 2.16 |
| JayLo            | 10                           | 4        | 5        | 19  | 6.33 | 2.62 | 17                  | 12       | 8        | 37  | 12.33 | 3.68 |
| Jessica          | 9                            | 5        | 8        | 22  | 7.33 | 1.70 | 18                  | 14       | 15       | 47  | 15.67 | 1.70 |
| Joe              | 8                            | 4        | 5        | 17  | 5.67 | 1.70 | 16                  | 15       | 9        | 40  | 13.33 | 3.09 |
| John             | 9                            | 5        | NA       | 14  | 7.00 | 2.00 | 17                  | 16       | NA       | 33  | 16.50 | 0.50 |
| Jongsong         | 8                            | 5        | 4        | 17  | 5.67 | 1.70 | 16                  | 14       | 8        | 38  | 12.67 | 3.40 |
| Jurek            | 9                            | 5        | 7        | 21  | 7.00 | 1.63 | 16                  | 14       | 9        | 39  | 13.00 | 2.94 |

|                |      |      |      |     |      |      |       |       |      |      |       |      |
|----------------|------|------|------|-----|------|------|-------|-------|------|------|-------|------|
| Kaikos         | 10   | 4    | 5    | 19  | 6.33 | 2.62 | 16    | 14    | 8    | 38   | 12.67 | 3.40 |
| Kirgistan      | 8    | 4    | 3    | 15  | 5.00 | 2.16 | 16    | 14    | 11   | 41   | 13.67 | 2.05 |
| Kiribati       | 8    | 4    | 5    | 17  | 5.67 | 1.70 | 16    | 14    | 12   | 42   | 14.00 | 1.63 |
| Kokosnuss      | 9    | 6    | 5    | 20  | 6.67 | 1.70 | 17    | 12    | 11   | 40   | 13.33 | 2.62 |
| Kolumbien      | 8    | 4    | 3    | 15  | 5.00 | 2.16 | 16    | 14    | 13   | 43   | 14.33 | 1.25 |
| Lacrima        | 9    | 4    | 6    | 19  | 6.33 | 2.05 | 21    | 14    | 9    | 44   | 14.67 | 4.92 |
| Langschweif    | 9    | 5    | 4    | 18  | 6.00 | 2.16 | 16    | 14    | 3    | 33   | 11.00 | 5.72 |
| Lavender       | 8    | 5    | 4    | 17  | 5.67 | 1.70 | 15    | 13    | 8    | 36   | 12.00 | 2.94 |
| Lawrence       | 9    | 5    | 4    | 18  | 6.00 | 2.16 | 16    | 14    | 5    | 35   | 11.67 | 4.78 |
| Leberbluemchen | 8    | 4    | 3    | 15  | 5.00 | 2.16 | 15    | 11    | 13   | 39   | 13.00 | 1.63 |
| Lenka          | 8    | 5    | 4    | 17  | 5.67 | 1.70 | 15    | 13    | 3    | 31   | 10.33 | 5.25 |
| Lennox         | 9    | 5    | 4    | 18  | 6.00 | 2.16 | 14    | 12    | 8    | 34   | 11.33 | 2.49 |
| Levuka         | 8    | 5    | 3    | 16  | 5.33 | 2.05 | 16    | 12    | 7    | 35   | 11.67 | 3.68 |
| Lockes         | 8    | 5    | 2    | 15  | 5.00 | 2.45 | 15    | 13    | 14   | 42   | 14.00 | 0.82 |
| Lona           | 9    | 3    | 5    | 17  | 5.67 | 2.49 | 16    | 12    | 6    | 34   | 11.33 | 4.11 |
| Longmorn       | 8    | 5    | 4    | 17  | 5.67 | 1.70 | 17    | 13    | 9    | 39   | 13.00 | 3.27 |
| Taras          | 8    | 5    | 5    | 18  | 6.00 | 1.41 | 17    | 15    | 9    | 41   | 13.67 | 3.40 |
| Thalia         | 7    | 5    | 5    | 17  | 5.67 | 0.94 | 17    | 17    | 7    | 41   | 13.67 | 4.71 |
| Timo           | 9    | 4    | 4    | 17  | 5.67 | 2.36 | 16    | 13    | 11   | 40   | 13.33 | 2.05 |
| Trevor         | 9    | 5    | 4    | 18  | 6.00 | 2.16 | 13    | 13    | 4    | 30   | 10.00 | 4.24 |
| <b>Sum</b>     | 373  | 204  | 189  | 766 |      |      | 723   | 593   | 383  | 1699 |       |      |
| <b>Mean</b>    | 8.48 | 4.64 | 4.50 |     |      |      | 16.43 | 13.48 | 9.12 |      |       |      |
| <b>SD</b>      | 0.62 | 0.64 | 1.55 |     |      |      | 1.56  | 1.44  | 3.03 |      |       |      |