**Título EN:** Changes in numbers and distribution of Yellow-legged Gull *Larus michahellis* nestingin Portugal during the last two decades

**Título PT:** Alterações no tamanho populacional e distribuição das gaivotas-de-patas-amarelas *Larus michahellis* nidificantes em Portugal, ao longo das últimas duas décadas

**Título curto EN:** Yellow-legged Gulls nesting in Portugal

**Título curto PT:** As gaivotas-de-patas-amarelas nidificantes em Portugal

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Table S1\_ Predicting variables included in the analysis to evaluate the effect of anthropogenic food sources on the number of Yellow-legged Gull pairs breeding in Portugal in 2021. The mean distance between the location of all nests in a given municipality and the nearest landfill or fishing harbour was calculated as the centroid of all nest locations and the respective facility. The mean ± standard deviation weight of residues delivered to the nearest landfill (as amount of deliveries in tons), the mean weight of residues delivered to all landfills located within a radius of 35 km from the nest locations (as deliveries <35 km in tons), the amount of fish landed at the nearest fishing harbour (as fish landings in tons), the amount of fish landed at all fishing harbours located within a radius of 35 km from the nest locations (as fish landings <35 km in tons) and the mean weight of non-differentiated residues collected in a given municipality (as urban residues in tons). The number of breeding pairs and the annual growth rate of the Yellow-legged Gull population breeding in each municipality, compared to historical data (see Table 3), are also given.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Region/ District** | **Municipality** | **Landfills** | **Fishing harbours** | **Urban residues (t)** | **Yellow-legged Gulls** |
| **Nearest landfill** | **Distance (km)** | **Deliveries (t)** | **Deliveries <35km (t)** | **Nearest harbour** | **Distance (km)** | **Fish landings (t)** | **Fish landings <35km (t)** |  | **N pairs** | **Growth rate** |
| ***Mainland*** |  |  |  |  |  |  |  |  |  |  |  |  |
| **Braga** | Braga | Póvoa de Lanhoso | 9.25 | 98700.83 ± 15511.69 | 387478.47 ± 23376.94 | Povoa de Varzim | 35.22 | 1835.74 ± 532.73 | 1835.74 ± 532.73 | 65061.08 ± 4480.05 | 6 | 4.18 |
|  | Esposende | Viana do Castelo | 12.91 | 122653.17 ± 3147.89 | 122653.17 ± 3147.89 | Povoa de Varzim | 17.21 | 1835.74 ± 532.73 | 1835.74 ± 532.73 | 18355.38 ± 744.89 | 1 | 0.00 |
|  | Guimarães | Guimarães | 8.45 | 52356.03 ± 3796.46 | 369537.31 ± 26605.59 | Povoa de Varzim | 40.6 | 1835.74 ± 532.73 | 0.00 ± 0.00 | 54860.62 ± 2024.04 | 3 | 2.54 |
| **Coimbra** | Figueira da Foz | Coimbra | 30.5 | 120127.83 ± 18579.37 | 120127.83 ± 18579.37 | Figueira da Foz | 1.22 | 10967.26 ± 3627.8 | 10967.26 ± 3627.8 | 28557.92 ± 3274.37 | 27 | 7.82 |
| **Faro** | Aljezur | Portimão | 31.28 | 174554.67 ± 9952.00 | 174554.67 ± 9952.00 | Lagos | 26.8 | 2724.58 ± 619.34 | 2724.58 ± 619.34 | 3440.54 ± 383.78 | 4 | -5.65 |
|  | Faro | Loulé | 34.75 | 148694.72 ± 8477.63 | 148694.72 ± 8477.63 | Olhão | 8.38 | 12123.26 ± 3021.52 | 12123.26 ± 3021.52 | 32437.69 ± 3375.15 | 485 | 15.18 |
|  | Lagoa | Portimão | 13.21 | 174554.67 ± 9952.00 | 174554.67 ± 9952.00 | Portimão | 1 | 6578.26 ± 2229.82 | 6578.26 ± 2229.82 | 16999.62 ± 1745.09 | 5 | -5.88 |
|  | Lagos | Portimão | 18.46 | 174554.67 ± 9952.00 | 174554.67 ± 9952.00 | Lagos | 1.5 | 2724.58 ± 619.34 | 2724.58 ± 619.34 | 20138.77 ± 2067.59 | 90 | -0.64 |
|  | Loulé | Loulé | 24.73 | 148694.72 ± 8477.63 | 148694.72 ± 8477.63 | Olhão | 25.04 | 12123.26 ± 3021.52 | 12123.26 ± 3021.52 | 46158.62 ± 4368 | 2 | 1.60 |
|  | Olhão | Loulé | 33.1 | 148694.72 ± 8477.63 | 148694.72 ± 8477.63 | Olhão | 3.75 | 12123.26 ± 3021.52 | 12123.26 ± 3021.52 | 21446.85 ± 2468.19 | 57 | 9.68 |
|  | Portimão | Portimão | 11.02 | 174554.67 ± 9952.00 | 174554.67 ± 9952.00 | Portimão | 1.37 | 6578.26 ± 2229.82 | 6578.26 ± 2229.82 | 30505.62 ± 3220.85 | 96 | -0.81 |
|  | Silves | Portimão | 19.12 | 174554.67 ± 9952.00 | 174554.67 ± 9952.00 | Ferragudo | 14.57 | -- | -- | 19653 ± 2093.51 | 4 | 3.22 |
|  | Vila do Bispo | Portimão | 43.45 | 174554.67 ± 9952.00 | 174554.67 ± 9952.00 | Sagres | 3.43 | -- | -- | 4366.54 ± 901.98 | 254 | 1.44 |
| **Leiria** | Caldas da Rainha | Cadaval | 24.39 | 96892.23 ± 12365.36 | 96892.23 ± 12365.36 | Nazaré | 20.31 | 5880.79 ± 8161.57 | 5880.79 ± 8161.57 | 20892.46 ± 975.62 | 1 | 0.00 |
|  | Nazaré | Leiria | 22.42 | 112668.67 ± 12423.24 | 112668.52 ± 12423.25 | Nazaré | 1.73 | 5880.79 ± 8161.57 | 5880.79 ± 8161.57 | 9040.69 ± 655.25 | 19 | 6.96 |
|  | Peniche | Cadaval | 28.32 | 96892.23 ± 12365.36 | 96892.23 ± 12365.36 | Peniche | 1.71 | 14410.84 ± 3430.31 | 14410.84 ± 3430.31 | 15583.15 ± 1132.03 | 247 | 0.18 |
| **Lisboa** | Cascais | Seixal | 26.46 | 175553.67 ± 9371.08 | 325491.04 ± 133660.22 | Cascais | 1.41 | 429.79 ± 348.46 | 429.79 ± 348.46 | 87516.23 ± 8584.82 | 25 | -2.78 |
|  | Lisboa | Seixal | 13 | 175553.67 ± 9371.08 | 501044.68 ± 140927.45 | Cascais | 20.63 | 429.79 ± 348.46 | 429.79 ± 348.46 | 255766 ± 31732.47 | 187 | 12.70 |
|  | Mafra | Abrunheira | 11.86 | 149937.33 ± 126669.55 | 149937.39 ± 126669.63 | Cascais | 0.37 | 429.79 ± 348.46 | 429.79 ± 348.46 | 30541.69 ± 4250.82 | 16 | 6.54 |
|  | Odivelas | Seixal | 17.7 | 175553.67 ± 9371.08 | 501044.68 ± 140927.45 | Cascais | 20.34 | 429.79 ± 348.46 | 429.79 ± 348.46 | -- | 1 |  |
|  | Oeiras | Seixal | 14.3 | 175553.67 ± 9371.08 | 501044.68 ± 140927.45 | Cascais | 16.49 | 429.79 ± 348.46 | 429.79 ± 348.46 | 58709.23 ± 4128.24 | 5 | 3.75 |
|  | Torres Vedras | Cadaval | 19.02 | 96892.23 ± 12365.36 | 246829.62 ± 124332.86 | Peniche | 21.61 | 14410.84 ± 3430.31 | 14410.84 ± 3430.31 | 32208.62 ± 1677.66 | 1 | 0.00 |
| **Porto** | Gondomar | Maia | 10.46 | 23461.5 ± 9586.32 | 307526.97 ± 12064.11 | Matosinhos | 12.87 | 22797.21 ± 6828.56 | 22797.21 ± 6828.56 | 60042.31 ± 3937.05 | 1 | 0.00 |
|  | Maia | Maia | 3.08 | 23461.5 ± 9586.32 | 307526.97 ± 12064.11 | Matosinhos | 8.95 | 22797.21 ± 6828.56 | 22797.21 ± 6828.56 | 42147.38 ± 3927.9 | 15 | 6.39 |
|  | Matosinhos | Maia | 5.45 | 23461.5 ± 9586.32 | 246114.51 ± 9637.36 | Matosinhos | 1.98 | 22797.21 ± 6828.56 | 22797.21 ± 6828.56 | 71267.31 ± 5236.19 | 94 | 10.94 |
|  | Penafiel | Lustosa | 12.81 | 65584.83 ± 3224.18 | 249447.97 ± 17104.45 | Matosinhos | 35.09 | 22797.21 ± 6828.56 | 0.00 ± 0.00 | -- | 1 |  |
|  | Porto | Sermonde | 10.9 | 163117.83 ± 12218.99 | 272909.57 ± 12102.33 | Matosinhos | 10.06 | 22797.21 ± 6828.56 | 22797.21 ± 6828.56 | 115140.23 ± 11403.48 | 487 | 15.19 |
|  | Póvoa de Varzim | Maia | 19.45 | 23461.5 ± 9586.32 | 198470.84 ± 6354.93 | Povoa de Varzim | 0.92 | 1835.74 ± 532.73 | 1835.74 ± 532.73 | 28728.54 ± 2451.44 | 118 | 11.52 |
|  | Valongo | Maia | 13.76 | 23461.5 ± 9586.32 | 272909.57 ± 12102.33 | Matosinhos | 17.37 | 22797.21 ± 6828.56 | 22797.21 ± 6828.56 | 30981.23 ± 1722.32 | 1 | 0.00 |
|  | Vila do Conde | Maia | 16.23 | 23461.5 ± 9586.32 | 198470.84 ± 6354.93 | Póvoa de Varzim | 2.88 | 1835.74 ± 532.73 | 1835.74 ± 532.73 | 34970.31 ± 2215.36 | 19 | 6.96 |
|  | Vila Nova de Gaia | Sermonde | 9.8 | 163117.83 ± 12218.99 | 272909.57 ± 12102.33 | Matosinhos | 9.82 | 22797.21 ± 6828.56 | 22797.21 ± 6828.56 | 130756.92 ± 5886.32 | 77 | 10.44 |
| **Setúbal** | Almada | Seixal | 7.33 | 175553.67 ± 9371.08 | 351107.29 ± 18742.14 | Sesimbra | 26.44 | 19960.79 ± 6826.27 | 19960.79 ± 6826.27 | 86669.77 ± 10594.21 | 32 | 8.24 |
|  | Sesimbra | Seixal | 18.78 | 175553.67 ± 9371.08 | 351107.29 ± 18742.14 | Sesimbra | 1.29 | 19960.79 ± 6826.27 | 19960.79 ± 6826.27 | 30306.00 ± 4470.91 | 59 | 9.77 |
|  | Sines | Ermidas do Sado | 45.01 | 53155.83 ± 6879.02 | 0 ± 0 | Sines | 4.17 | 9293.58 ± 1738.20 | 9293.58 ± 1738.20 | 8127.46 ± 561.9 | 1165 | 4.10 |
| **Viana do Castelo** | Caminha | Viana do Castelo | 21.04 | 122653.17 ± 3147.89 | 157171.18 ± 3675.23 | Viana do Castelo | 14.77 | 1991.68 ± 433.29 | 1991.68 ± 433.29 | 10032.85 ± 624.22 | 21 | 7.21 |
|  | Viana do Castelo | Viana do Castelo | 7.74 | 122653.17 ± 3147.89 | 157171.18 ± 3675.23 | Viana do Castelo | 0.74 | 1991.68 ± 433.29 | 1991.68 ± 433.29 | 33454.69 ± 1314.24 | 37 | 8.60 |
| **Vila Real** | Vila Real | Boticas | 15.48 | 52356.03 ± 3796.46 | 52356.03 ± 3796.46 | Viana do Castelo | 84.18 | 1991.68 ± 433.29 | 0.00 ± 0.00 | 19528.23 ± 919.33 | 2 | 1.60 |
| ***Azores*** |  |  |  |  |  |  |  |  |  |  |  |  |
| **Corvo** | Vila do Corvo | Corvo | 278.84 | 113.00 ± 88.30 | 113.00 ± 88.30 | Corvo | 5.82 | 20.84 ± 8.25 | 20.84 ± 8.25 | 198.92 ± 41.41 | 41 | -2.02 |
| **Flores** | Lajes das Flores | Flores | 271.14 | 319.89 ± 98.39 | 319.89 ± 98.39 | Flores | 12.65 | 92.68 ± 24.67 | 92.68 ± 24.67 | 473.77 ± 261.18 | 12 | -2.55 |
|  | Santa Cruz das Flores | Flores | 273.14 | 319.89 ± 98.39 | 319.89 ± 98.39 | Flores | 8.04 | 92.68 ± 24.67 | 92.68 ± 24.67 | 1133.83 ± 593.29 | 32 | -3.61 |
| **Graciosa** | Santa Cruz da Graciosa | Graciosa | 74.34 | 354.44 ± 136.90 | 354.44 ± 136.9 | Graciosa | 5.99 | 137.53 ± 26.24 | 137.53 ± 26.24 | 1522.38 ± 187.77 | 46 | -4.84 |
| **Pico** | Madalena | Pico | 11.86 | 3303.33 ± 1595.82 | 3303.33 ± 1595.82 | Pico | 9.15 | 2129.21 ± 1411.54 | 2129.21 ± 1411.54 | 2295.77 ± 114.37 | 17 | -2.91 |
|  | Lajes do Pico | Pico | 18.16 | 3303.33 ± 1595.82 | 3303.33 ± 1595.82 | São Jorge | 24.84 | 294.86 ± 163.48 | 294.86 ± 163.48 | 1557.23 ± 149.13 | 39 | -0.68 |
|  | São Roque do Pico | Pico | 14.2 | 3303.33 ± 1595.82 | 3303.33 ± 1595.82 | São Jorge | 19.92 | 294.86 ± 163.48 | 294.86 ± 163.48 | 1249.38 ± 196.80 | 66 | -4.38 |
| **Santa Maria** | Vila do Porto | São Miguel | 100.71 | 59288.67 ± 2634.45 | 59288.67 ± 2634.45 | Santa Maria | 9.51 | 678.89 ± 495.24 | 678.89 ± 495.24 | 2008.92 ± 369.22 | 93 | -0.11 |
| **São Miguel** | Ponta Delgada | São Miguel | 15.31 | 59288.67 ± 2634.45 | 59288.67 ± 2634.45 | São Miguel | 14.31 | 5175.47 ± 1369.18 | 5175.47 ± 1369.18 | 33793.62 ± 5690.18 | 182 | -0.99 |
|  | Ribeira Grande | São Miguel | 12.14 | 59288.67 ± 2634.45 | 59288.67 ± 2634.45 | São Miguel | 10 | 5175.47 ± 1369.18 | 5175.47 ± 1369.18 | 13471.46 ± 1830.36 | 442 | -0.79 |
|  | Vila Franca do Campo | São Miguel | 17.23 | 59288.67 ± 2634.45 | 59288.67 ± 2634.45 | São Miguel | 17.34 | 5175.47 ± 1369.18 | 5175.47 ± 1369.18 | 4961.31 ± 678.00 | 64 | 11.21 |
| **Terceira** | Angra do Heroismo | Terceira | 12.11 | 12924.33 ± 7097.64 | 12924.33 ± 7097.64 | Terceira | 10.4 | 1155.42 ± 251.95 | 1155.42 ± 251.95 | 18887.31 ± 5514.76 | 548 | -1.25 |
|  | Praia da Vitória | Terceira | 13.01 | 12924.33 ± 7097.64 | 12924.33 ± 7097.64 | Terceira | 11.91 | 1155.42 ± 251.95 | 1155.42 ± 251.95 | 8705.62 ± 1448.37 | 42 | 3.48 |
| ***Madeira*** |  |  |  |  |  |  |  |  |  |  |  |  |
| **Madeira** | Funchal | Madeira | 32.76 | 3751.71 ± 515.05 | 3751.71 ± 515.05 | Madeira | 35.73 | 6452.26 ± 1288.18 | 0.00 ± 0.00 | 51813.31 ± 14061.95 | 10 | -9.26 |
|  | Machico | Madeira | 18.7 | 3751.71 ± 515.05 | 3751.71 ± 515.05 | Madeira | 6.09 | 6452.26 ± 1288.18 | 6452.26 ± 1288.18 | 8886.62 ± 1619.20 | 37 | -8.32 |
|  | Santa Cruz | Madeira | 40.25 | 3751.71 ± 515.05 | 3751.71 ± 515.05 | Madeira | 41.92 | 6452.26 ± 1288.18 | 0.00 ± 0.00 | 14911.00 ± 1978.18 | 6 | 4.18 |
| **Porto Santo** | Porto Santo | Madeira | 6.38 | 3751.71 ± 515.05 | 0.00 ± 0.00 | Porto Santo | 3.36 | 38.00 ± 33.79 | 38.00 ± 33.79 | 2843.77 ± 952.50 | 46 | -4.83 |
| ***Selvagens*** |  |  |  |  |  |  |  |  |  |  |  |  |
| **Selvagem Grande** |  | Madeira | 298.48 | 3751.71 ± 515.05 | 0.00 ± 0.00 | Madeira | 294.85 | 6452.26 ± 1288.18 | 0.00 ± 0.00 | 0.00 ± 0.00 | 6 | -2.37 |