Digital video aerial surveys of seabirds at Seagreen 2 & 3:

March 2019 to February 2021

Flight height analysis

# Results

## Flight Height

Estimates of mean flight height for the minimum, mean and maximum flight height scenarios are presented for each species in Tables - . The estimate of the proportion of birds at PCH for each scenario is based on the number of individual birds whose mean flight height fell within the rotor swept area.

The distribution of these heights are presented as box plots for each species in Figures , and . The grey boxes represent the middle 50% of the estimated flight heights for each scenario, and the mean of the population is indicated by the black dot. The distributions of flight height are also represented in ordered dot plots in Figures , and .

The spatial variation in flight heights are represented in Figures X.

All but one of the mean heights for either of the two species ranged below 252m (the maximum rotor height of the smallest turbine specification). As such, the estimated proportions of birds at PCH for the smallest and largest wind turbine scenarios are identical with the exception of the maximum July flight height for gannets.

### Kittiwake

#### Proportion of birds at PCH

Table : Mean height and proportion (%) of kittiwake at PCH in 1at site 1. For flight heights both the mean and the interquartile range (IQR), i.e. the middle 50% of the data, are reported for each of the bootstrapped flight height scenarios.

|  | | | | | | | **Proportion of birds at PCH  (%)** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Year** | **Month** | **Scenario** | **Sample Size  (n)** | **Mean bootstrapped  height estimate  (m)** | **+/- 95% CI** | **Inter-quartile  range** | **Small Scenario  (32 - 252m)** | **Large scenario  (32 - 322m)** |
| Year 1 | March | Low | 353 | 17.5 | (12.8-22.2) | 0-0 | 14.4 | 14 |
| Year 1 | Mean | 44.2 | (37.9-50.5) | 5.7-45.7 | 35.1 | 35 |
| Year 1 | High | 101.1 | (94.2-108) | 53.3-138.5 | 82.2 | 84 |
| Year 1 | May | Low | 139 | 22.3 | (14-30.6) | 0-0 | 19.4 | 19 |
| Year 1 | Mean | 52.2 | (41.3-63.1) | 10-64.3 | 36.7 | 38 |
| Year 1 | High | 119.5 | (109-130) | 73.4-154.7 | 92.1 | 96 |
| Year 1 | June | Low | 33 | 24.5 | (6.8-42.2) | 0-0.3 | 21.2 | 21 |
| Year 1 | Mean | 67.4 | (43.9-90.9) | 16-99 | 57.6 | 61 |
| Year 1 | High | 140.0 | (116.5-163.5) | 98.4-194.8 | 87.9 | 97 |
| Year 1 | July | Low | 143 | 26.7 | (17.7-35.7) | 0-11 | 21.0 | 22 |
| Year 1 | Mean | 64.9 | (53.6-76.2) | 14.5-96.5 | 51.0 | 52 |
| Year 1 | High | 138.8 | (128.2-149.4) | 94.2-181.9 | 91.6 | 96 |
| Year 1 | August | Low | 91 | 12.2 | (4.6-19.8) | 0-0.2 | 9.9 | 10 |
| Year 1 | Mean | 36.0 | (25.1-46.9) | 2.9-48.8 | 29.7 | 31 |
| Year 1 | High | 83.6 | (70.5-96.7) | 40.6-109.5 | 74.7 | 75 |
| Year 1 | September | Low | 32 | 2.0 | (0.1-3.9) | 0-1.1 | 0.0 | 0 |
| Year 1 | Mean | 14.8 | (9.9-19.7) | 3.9-25.2 | 6.2 | 6 |
| Year 1 | High | 47.5 | (38.1-56.9) | 29.1-64.9 | 71.9 | 72 |
| Year 1 | October | Low | 16 | 36.4 | (11.5-61.3) | 0-68.6 | 37.5 | 38 |
| Year 1 | Mean | 85.4 | (53.6-117.2) | 28.6-134.7 | 75.0 | 75 |
| Year 1 | High | 154.3 | (127.1-181.5) | 115.8-201.9 | 100.0 | 100 |
| Year 1 | November | Low | 11 | 46.3 | (9.8-82.8) | 0-45.3 | 45.5 | 45 |
| Year 1 | Mean | 80.1 | (38.3-121.9) | 24.9-107.7 | 63.6 | 64 |
| Year 1 | High | 125.2 | (84.7-165.7) | 66.6-158.5 | 100.0 | 100 |
| Year 1 | December | Low | 9 | 17.2 | (3.3-31.1) | 0-33.2 | 33.3 | 33 |
| Year 1 | Mean | 47.3 | (17.1-77.5) | 17.3-64.9 | 44.4 | 44 |
| Year 1 | High | 81.4 | (42.4-120.4) | 36.5-114.2 | 77.8 | 78 |
| Year 1 | February | Low | 97 | 38.3 | (28.1-48.5) | 0-62.3 | 40.2 | 40 |
| Year 1 | Mean | 79.5 | (68.1-90.9) | 37.2-113.5 | 77.3 | 77 |
| Year 1 | High | 134.9 | (123.4-146.4) | 93.7-163.4 | 93.8 | 98 |

Table : Mean height and proportion (%) of kittiwake at PCH in 2at site 1. For flight heights both the mean and the interquartile range (IQR), i.e. the middle 50% of the data, are reported for each of the bootstrapped flight height scenarios.

|  | | | | | | | **Proportion of birds at PCH  (%)** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Year** | **Month** | **Scenario** | **Sample Size  (n)** | **Mean bootstrapped  height estimate  (m)** | **+/- 95% CI** | **Inter-quartile  range** | **Small Scenario  (32 - 252m)** | **Large scenario  (32 - 322m)** |
| Year 2 | March | Low | 185 | 15.3 | (8.9-21.7) | 0-0.1 | 11.9 | 12 |
| Year 2 | Mean | 44.8 | (36.6-53) | 7.7-54.3 | 39.5 | 40 |
| Year 2 | High | 107.4 | (98.5-116.3) | 61.7-137.6 | 85.4 | 89 |
| Year 2 | April | Low | 283 | 10.8 | (7-14.6) | 0-0 | 10.6 | 11 |
| Year 2 | Mean | 33.3 | (27.5-39.1) | 2.1-36.5 | 29.7 | 30 |
| Year 2 | High | 88.1 | (80.7-95.5) | 36.5-125.7 | 77.0 | 78 |
| Year 2 | May | Low | 521 | 10.5 | (7.7-13.3) | 0-0 | 10.9 | 11 |
| Year 2 | Mean | 45.6 | (41.8-49.4) | 17.4-57.3 | 53.4 | 54 |
| Year 2 | High | 123.6 | (119.3-127.9) | 96.6-151.3 | 93.5 | 95 |
| Year 2 | June | Low | 483 | 16.6 | (13.3-19.9) | 0-3.6 | 17.8 | 18 |
| Year 2 | Mean | 44.4 | (39.4-49.4) | 1.8-75.9 | 40.4 | 40 |
| Year 2 | High | 88.8 | (82.7-94.9) | 27.5-138.5 | 71.2 | 73 |
| Year 2 | July | Low | 122 | 5.6 | (1-10.2) | 0-0 | 5.7 | 6 |
| Year 2 | Mean | 17.1 | (10.7-23.5) | 0-15.5 | 13.9 | 15 |
| Year 2 | High | 39.5 | (30.2-48.8) | 0-61 | 39.3 | 40 |
| Year 2 | August | Low | 178 | 6.6 | (4.3-8.9) | 0-3.6 | 6.2 | 6 |
| Year 2 | Mean | 36.8 | (32.1-41.5) | 10-51.4 | 51.7 | 52 |
| Year 2 | High | 85.1 | (77.6-92.6) | 47.2-118.6 | 80.3 | 80 |
| Year 2 | September | Low | 326 | 22.5 | (17.3-27.7) | 0-13.3 | 19.9 | 20 |
| Year 2 | Mean | 59.2 | (52.5-65.9) | 11.1-96.2 | 50.0 | 50 |
| Year 2 | High | 121.3 | (114.5-128.1) | 76.3-167.2 | 91.7 | 94 |
| Year 2 | October | Low | 48 | 18.0 | (9.1-26.9) | 0-36 | 27.1 | 27 |
| Year 2 | Mean | 40.1 | (27.7-52.5) | 3.8-63.6 | 39.6 | 40 |
| Year 2 | High | 73.3 | (58.2-88.4) | 29.9-105.8 | 75.0 | 75 |
| Year 2 | November | Low | 288 | 33.4 | (28.7-38.1) | 0-58.9 | 41.0 | 41 |
| Year 2 | Mean | 76.5 | (71.3-81.7) | 43.8-105.9 | 81.2 | 81 |
| Year 2 | High | 127.5 | (122.6-132.4) | 103.3-154.8 | 97.6 | 98 |
| Year 2 | December | Low | 24 | 26.8 | (1.4-52.2) | 0-13.9 | 12.5 | 17 |
| Year 2 | Mean | 53.2 | (27.3-79.1) | 13-57.1 | 58.3 | 62 |
| Year 2 | High | 91.8 | (63.7-119.9) | 57.3-125 | 70.8 | 75 |
| Year 2 | January | Low | 141 | 22.1 | (16.3-27.9) | 0-42.4 | 27.0 | 27 |
| Year 2 | Mean | 47.3 | (39-55.6) | 5.4-82.6 | 46.1 | 46 |
| Year 2 | High | 84.1 | (74.2-94) | 36.4-128.7 | 77.3 | 77 |
| Year 2 | February | Low | 24 | 37.1 | (14.6-59.6) | 0-78.7 | 37.5 | 38 |
| Year 2 | Mean | 68.8 | (38.5-99.1) | 8-133 | 45.8 | 46 |
| Year 2 | High | 117.3 | (85.4-149.2) | 54.5-186.6 | 83.3 | 92 |

Table : Mean height and proportion (%) of kittiwake at PCH in 1at site 2. For flight heights both the mean and the interquartile range (IQR), i.e. the middle 50% of the data, are reported for each of the bootstrapped flight height scenarios.

|  | | | | | | | **Proportion of birds at PCH  (%)** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Year** | **Month** | **Scenario** | **Sample Size  (n)** | **Mean bootstrapped  height estimate  (m)** | **+/- 95% CI** | **Inter-quartile  range** | **Small Scenario  (32 - 252m)** | **Large scenario  (32 - 322m)** |
| Year 1 | March | Low | 410 | 27.7 | (22.3-33.1) | 0-8 | 22.7 | 23 |
| Year 1 | Mean | 58.5 | (51.8-65.2) | 9.8-81.5 | 44.4 | 45 |
| Year 1 | High | 117.5 | (110.7-124.3) | 67-166.7 | 84.6 | 89 |
| Year 1 | May | Low | 304 | 22.1 | (16.1-28.1) | 0-0 | 17.1 | 17 |
| Year 1 | Mean | 52.6 | (45.2-60) | 7.9-59.4 | 42.1 | 42 |
| Year 1 | High | 118.2 | (110.9-125.5) | 72.3-148.5 | 87.8 | 92 |
| Year 1 | June | Low | 64 | 14.3 | (3.5-25.1) | 0-0 | 9.4 | 9 |
| Year 1 | Mean | 50.1 | (35.1-65.1) | 10.4-62.4 | 42.2 | 42 |
| Year 1 | High | 124.0 | (105.7-142.3) | 79.7-176.7 | 79.7 | 86 |
| Year 1 | July | Low | 115 | 41.7 | (29.2-54.2) | 0-67.6 | 31.3 | 31 |
| Year 1 | Mean | 79.9 | (65.5-94.3) | 13-136.3 | 61.7 | 63 |
| Year 1 | High | 144.6 | (130.8-158.4) | 88.7-204.6 | 81.7 | 91 |
| Year 1 | August | Low | 278 | 16.5 | (11.7-21.3) | 0-0.3 | 16.5 | 17 |
| Year 1 | Mean | 40.6 | (34-47.2) | 1.7-55.5 | 35.3 | 35 |
| Year 1 | High | 82.4 | (74.4-90.4) | 26.9-124.8 | 71.2 | 71 |
| Year 1 | September | Low | 80 | 4.8 | (1.8-7.8) | 0-1.2 | 5.0 | 5 |
| Year 1 | Mean | 18.1 | (12.7-23.5) | 1.1-26.2 | 22.5 | 22 |
| Year 1 | High | 46.7 | (38.4-55) | 16.2-74 | 57.5 | 57 |
| Year 1 | October | Low | 54 | 7.5 | (0.9-14.1) | 0-0.1 | 7.4 | 7 |
| Year 1 | Mean | 25.6 | (15.8-35.4) | 0.4-39.1 | 27.8 | 28 |
| Year 1 | High | 61.8 | (48.3-75.3) | 19.8-88.9 | 70.4 | 70 |
| Year 1 | November | Low | 15 | 8.4 | (0.7-16.1) | 0-9.5 | 13.3 | 13 |
| Year 1 | Mean | 33.3 | (11.7-54.9) | 0.4-55.3 | 40.0 | 40 |
| Year 1 | High | 71.3 | (35.9-106.7) | 7-113.1 | 60.0 | 60 |
| Year 1 | December | Low | 20 | 11.2 | (1.5-20.9) | 0-3.2 | 20.0 | 20 |
| Year 1 | Mean | 29.4 | (13.8-45) | 1.9-47.3 | 35.0 | 35 |
| Year 1 | High | 62.1 | (40.4-83.8) | 21.1-106.9 | 65.0 | 65 |
| Year 1 | February | Low | 149 | 32.8 | (24.5-41.1) | 0-40.2 | 30.2 | 30 |
| Year 1 | Mean | 65.6 | (55.9-75.3) | 18.3-99.4 | 59.7 | 60 |
| Year 1 | High | 114.9 | (105.4-124.4) | 76.1-145.3 | 88.6 | 91 |

Table : Mean height and proportion (%) of kittiwake at PCH in 2at site 2. For flight heights both the mean and the interquartile range (IQR), i.e. the middle 50% of the data, are reported for each of the bootstrapped flight height scenarios.

|  | | | | | | | **Proportion of birds at PCH  (%)** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Year** | **Month** | **Scenario** | **Sample Size  (n)** | **Mean bootstrapped  height estimate  (m)** | **+/- 95% CI** | **Inter-quartile  range** | **Small Scenario  (32 - 252m)** | **Large scenario  (32 - 322m)** |
| Year 2 | March | Low | 235 | 16.9 | (11.7-22.1) | 0-2.6 | 16.6 | 17 |
| Year 2 | Mean | 48.1 | (40.5-55.7) | 7.7-63.9 | 40.0 | 40 |
| Year 2 | High | 106.2 | (97.7-114.7) | 61.3-147.4 | 82.1 | 86 |
| Year 2 | April | Low | 362 | 7.7 | (4.9-10.5) | 0-0 | 7.5 | 7 |
| Year 2 | Mean | 35.7 | (30.8-40.6) | 4.2-45.1 | 32.0 | 32 |
| Year 2 | High | 104.8 | (98.5-111.1) | 59.9-145.7 | 87.0 | 88 |
| Year 2 | May | Low | 429 | 11.8 | (8.1-15.5) | 0-0 | 10.3 | 10 |
| Year 2 | Mean | 50.0 | (45.2-54.8) | 16.1-61.1 | 58.5 | 59 |
| Year 2 | High | 129.3 | (124.1-134.5) | 95.3-158.6 | 91.8 | 95 |
| Year 2 | June | Low | 310 | 12.5 | (9.2-15.8) | 0-0.2 | 14.8 | 15 |
| Year 2 | Mean | 35.9 | (30.5-41.3) | 1.6-51.1 | 33.2 | 33 |
| Year 2 | High | 77.7 | (70.7-84.7) | 24.7-119.1 | 68.7 | 69 |
| Year 2 | July | Low | 90 | 4.7 | (2.3-7.1) | 0-2.3 | 6.7 | 7 |
| Year 2 | Mean | 35.4 | (28.3-42.5) | 4.6-64.4 | 45.6 | 46 |
| Year 2 | High | 78.7 | (66.4-91) | 25.6-129.8 | 70.0 | 70 |
| Year 2 | August | Low | 578 | 5.5 | (4.4-6.6) | 0-3 | 6.1 | 6 |
| Year 2 | Mean | 33.0 | (30.5-35.5) | 6.7-51.7 | 42.9 | 43 |
| Year 2 | High | 76.1 | (71.8-80.4) | 31.7-112.6 | 74.7 | 75 |
| Year 2 | September | Low | 194 | 18.4 | (11.6-25.2) | 0-0.4 | 14.9 | 15 |
| Year 2 | Mean | 50.0 | (41.3-58.7) | 6-68.9 | 41.8 | 42 |
| Year 2 | High | 107.0 | (97.7-116.3) | 60.3-145.6 | 82.5 | 85 |
| Year 2 | October | Low | 169 | 7.1 | (4.7-9.5) | 0-4.3 | 8.3 | 8 |
| Year 2 | Mean | 26.5 | (22-31) | 1.2-45 | 35.5 | 36 |
| Year 2 | High | 55.7 | (49.4-62) | 17.4-84.1 | 65.1 | 65 |
| Year 2 | November | Low | 132 | 27.8 | (20.9-34.7) | 0-51.6 | 32.6 | 33 |
| Year 2 | Mean | 68.0 | (59.4-76.6) | 29.8-95.1 | 73.5 | 73 |
| Year 2 | High | 123.5 | (115.3-131.7) | 92.8-148.6 | 96.2 | 98 |
| Year 2 | December | Low | 119 | 21.3 | (14.8-27.8) | 0-34.9 | 26.1 | 26 |
| Year 2 | Mean | 47.6 | (39-56.2) | 5.2-81.1 | 52.1 | 52 |
| Year 2 | High | 89.8 | (79.3-100.3) | 35.7-134.4 | 76.5 | 76 |
| Year 2 | January | Low | 97 | 20.8 | (13.9-27.7) | 0-31.5 | 23.7 | 24 |
| Year 2 | Mean | 46.7 | (37.6-55.8) | 10.4-77.7 | 46.4 | 46 |
| Year 2 | High | 85.5 | (75.1-95.9) | 45.5-126 | 83.5 | 84 |
| Year 2 | February | Low | 8 | 23.8 | (-13.2-60.8) | 0-9.8 | 25.0 | 25 |
| Year 2 | Mean | 46.8 | (5.1-88.5) | 7.3-68.3 | 37.5 | 38 |
| Year 2 | High | 89.2 | (45.7-132.7) | 59.3-130 | 87.5 | 88 |

#### Flight height ranges

For interpretation of the following graphs, see Section 3.2.

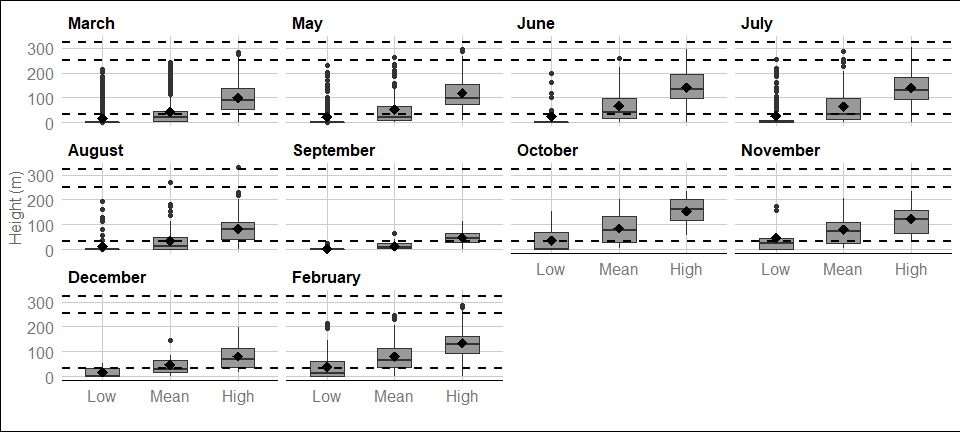


Figure : Distribution of kittiwake flight heights from minimum (2.5th percentile), mean and maximum (97.5th percentile) bootstrapped estimates in Year 1 at site SG2. The mean of the population for each distribution is indicated by the black dot, and the middle line represents the median. The grey boxes represent the middle 50% of the data. The dotted lines indicate the minimum and maximum rotor heights of both wind turbine scenarios.

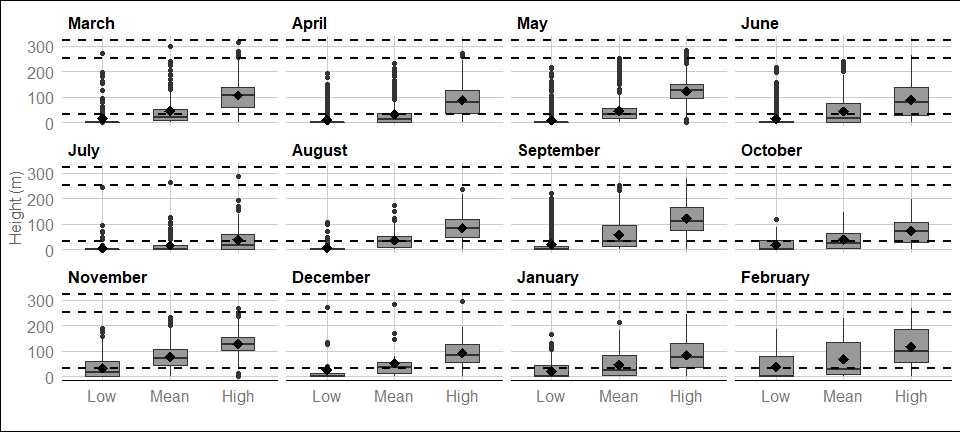


Figure : Distribution of kittiwake flight heights from minimum (2.5th percentile), mean and maximum (97.5th percentile) bootstrapped estimates in Year 2 at site SG2. The mean of the population for each distribution is indicated by the black dot, and the middle line represents the median. The grey boxes represent the middle 50% of the data. The dotted lines indicate the minimum and maximum rotor heights of both wind turbine scenarios.

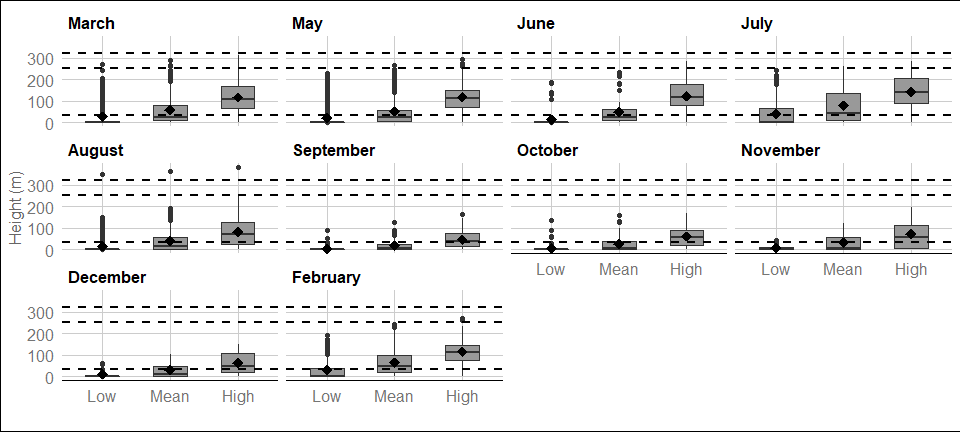


Figure : Distribution of kittiwake flight heights from minimum (2.5th percentile), mean and maximum (97.5th percentile) bootstrapped estimates in Year 1 at site SG3. The mean of the population for each distribution is indicated by the black dot, and the middle line represents the median. The grey boxes represent the middle 50% of the data. The dotted lines indicate the minimum and maximum rotor heights of both wind turbine scenarios.

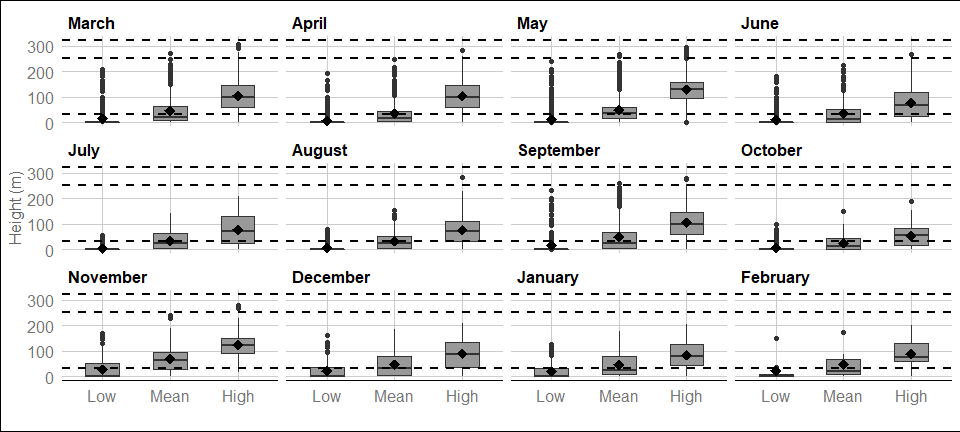


Figure : Distribution of kittiwake flight heights from minimum (2.5th percentile), mean and maximum (97.5th percentile) bootstrapped estimates in Year 2 at site SG3. The mean of the population for each distribution is indicated by the black dot, and the middle line represents the median. The grey boxes represent the middle 50% of the data. The dotted lines indicate the minimum and maximum rotor heights of both wind turbine scenarios.

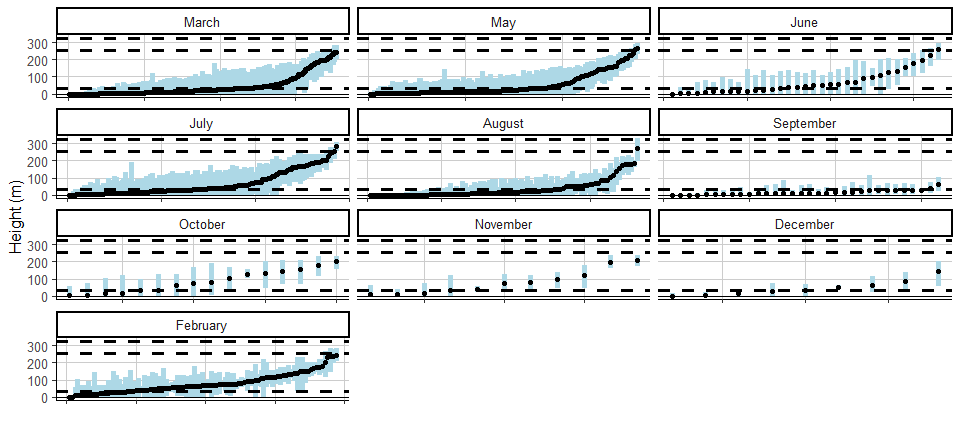


Figure : Ordered height estimates of individual kittiwake in the survey area with minimum and maximum potential height range for both smallest and largest turbine specifications in Year 1 at site SG2.

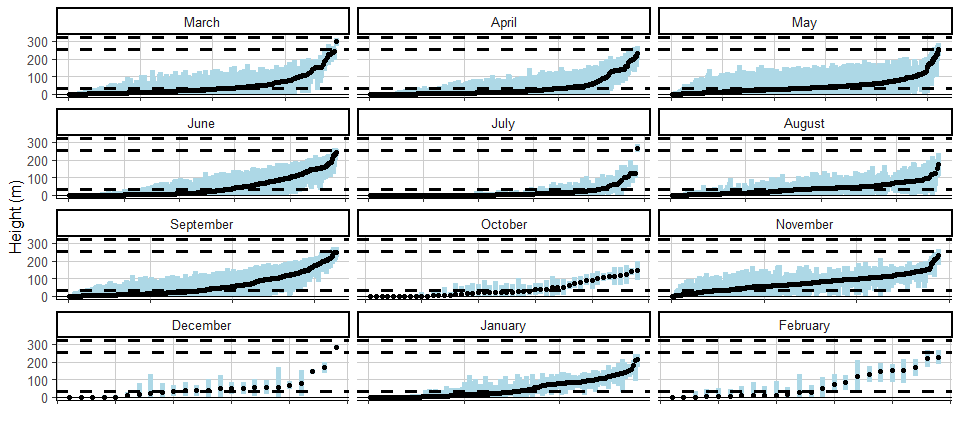


Figure : Ordered height estimates of individual kittiwake in the survey area with minimum and maximum potential height range for both smallest and largest turbine specifications in Year 2 at site SG2.

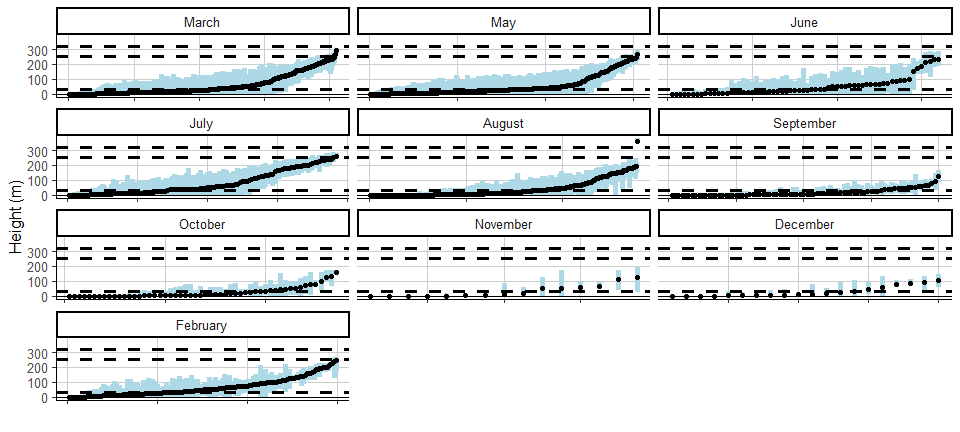


Figure : Ordered height estimates of individual kittiwake in the survey area with minimum and maximum potential height range for both smallest and largest turbine specifications in Year 1 at site SG3.

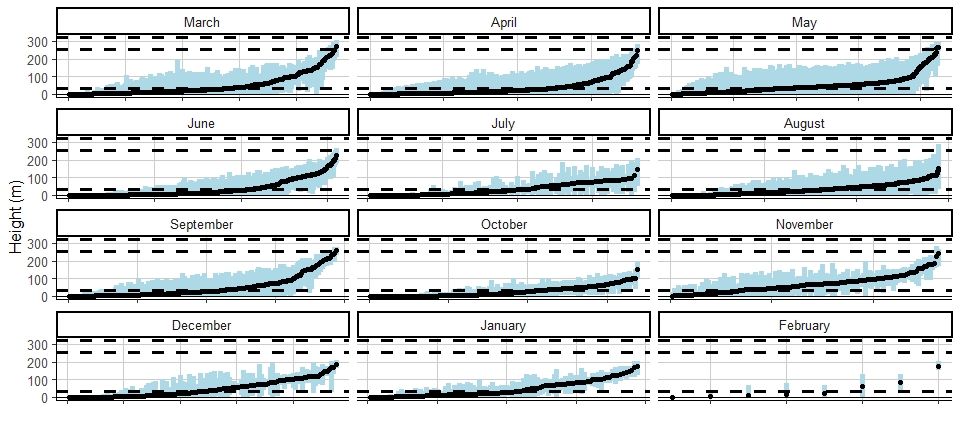


Figure : Ordered height estimates of individual kittiwake in the survey area with minimum and maximum potential height range for both smallest and largest turbine specifications in Year 2 at site SG3.

#### Spatial variation in flight height

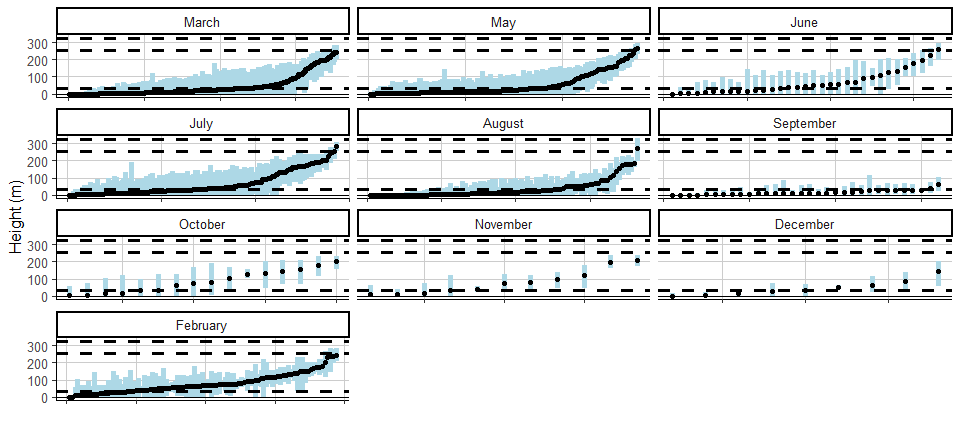


Figure : Ordered height estimates of individual kittiwake in the survey area with minimum and maximum potential height range for both smallest and largest turbine specifications in Year 1 at site SG2.

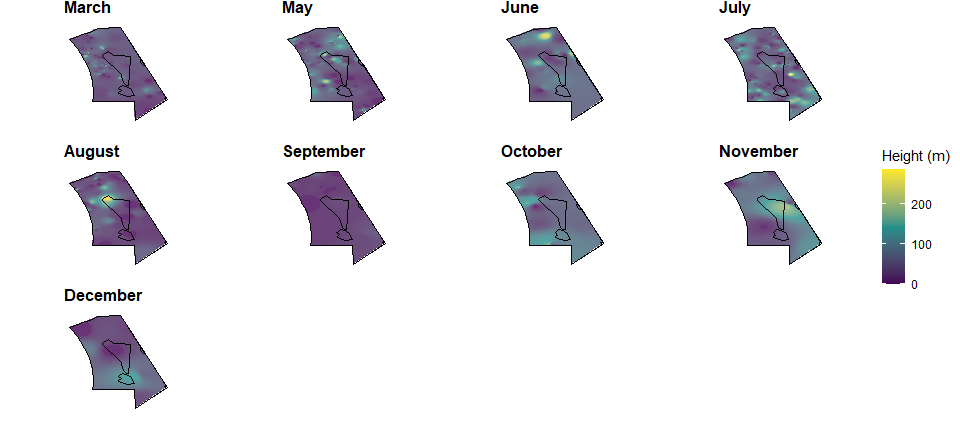


Figure : Two-dimensional spatial variation in estimated mean flight heights of kittiwake in Year 1 at site SG2. Flight height estimates were derived using an inverse distance weighted interpolation. Grey plots indicate months were no birds of this species were recorded.

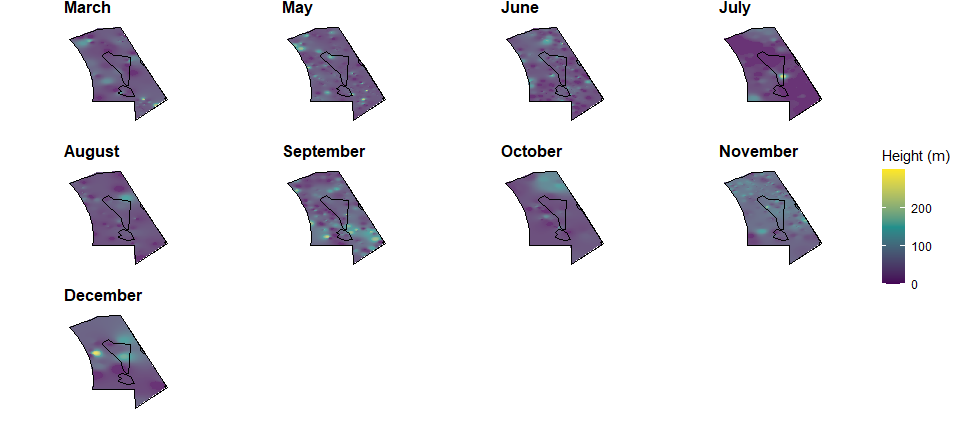


Figure : Two-dimensional spatial variation in estimated mean flight heights of kittiwake in Year 2 at site SG2. Flight height estimates were derived using an inverse distance weighted interpolation. Grey plots indicate months were no birds of this species were recorded.

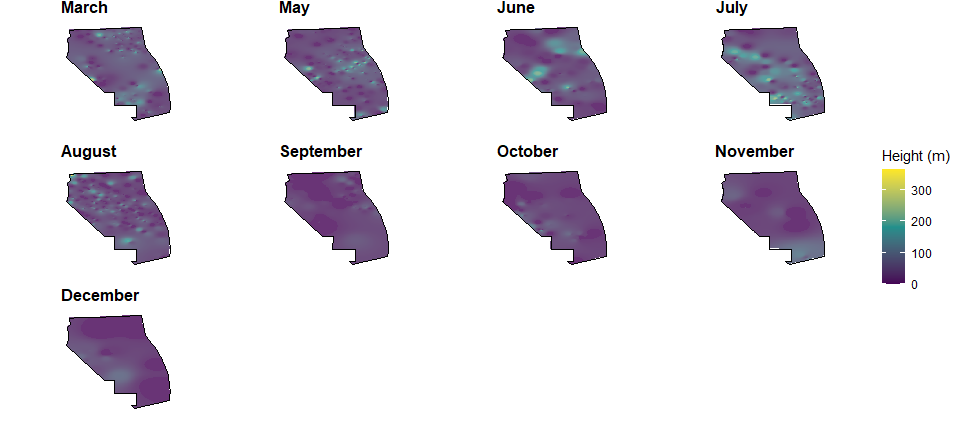


Figure : Two-dimensional spatial variation in estimated mean flight heights of kittiwake in Year 1 at site SG3. Flight height estimates were derived using an inverse distance weighted interpolation. Grey plots indicate months were no birds of this species were recorded.

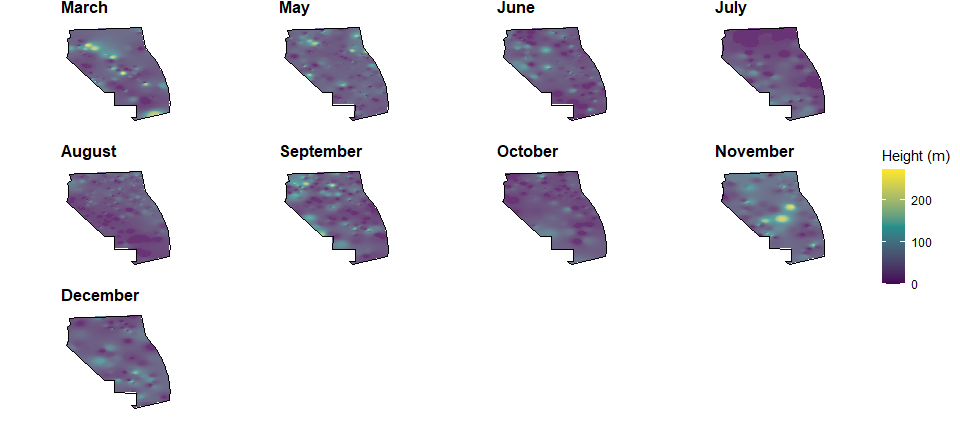


Figure : Two-dimensional spatial variation in estimated mean flight heights of kittiwake in Year 2 at site SG3. Flight height estimates were derived using an inverse distance weighted interpolation. Grey plots indicate months were no birds of this species were recorded.

### Gannet

#### Proportion of birds at PCH

Table : Mean height and proportion (%) of gannet at PCH in 1at site 1. For flight heights both the mean and the interquartile range (IQR), i.e. the middle 50% of the data, are reported for each of the bootstrapped flight height scenarios.

|  | | | | | | | **Proportion of birds at PCH  (%)** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Year** | **Month** | **Scenario** | **Sample Size  (n)** | **Mean bootstrapped  height estimate  (m)** | **+/- 95% CI** | **Inter-quartile  range** | **Small Scenario  (32 - 252m)** | **Large scenario  (32 - 322m)** |
| Year 1 | March | Low | 11 | 22.8 | (-21.2-66.8) | 0-0 | 9.1 | 9 |
| Year 1 | Mean | 45.7 | (-2.7-94.1) | 6.3-44.6 | 18.2 | 27 |
| Year 1 | High | 99.7 | (52.2-147.2) | 60.4-117.5 | 81.8 | 91 |
| Year 1 | May | Low | 20 | 88.8 | (43.8-133.8) | 0-196.7 | 50.0 | 50 |
| Year 1 | Mean | 118.4 | (69.4-167.4) | 8.9-240.9 | 45.0 | 60 |
| Year 1 | High | 160.8 | (114.2-207.4) | 67.7-266 | 45.0 | 85 |
| Year 1 | June | Low | 36 | 21.8 | (-0.2-43.8) | 0-0 | 5.6 | 11 |
| Year 1 | Mean | 61.5 | (38.1-84.9) | 18.1-66.6 | 44.4 | 50 |
| Year 1 | High | 143.8 | (123.1-164.5) | 96.9-181.9 | 88.9 | 100 |
| Year 1 | July | Low | 87 | 37.5 | (21.5-53.5) | 0-0 | 23.0 | 23 |
| Year 1 | Mean | 66.2 | (48.4-84) | 6.4-73.7 | 43.7 | 48 |
| Year 1 | High | 123.9 | (106.5-141.3) | 64.1-161 | 72.4 | 86 |
| Year 1 | August | Low | 47 | 28.8 | (9.9-47.7) | 0-0 | 14.9 | 17 |
| Year 1 | Mean | 51.4 | (28.9-73.9) | 2.8-47.4 | 29.8 | 32 |
| Year 1 | High | 103.1 | (80.1-126.1) | 52.7-133.5 | 72.3 | 83 |
| Year 1 | September | Low | 115 | 21.4 | (12.4-30.4) | 0-19.6 | 16.5 | 17 |
| Year 1 | Mean | 44.8 | (34.4-55.2) | 4.8-61.6 | 43.5 | 44 |
| Year 1 | High | 93.0 | (82.7-103.3) | 48.7-113.3 | 86.1 | 88 |
| Year 1 | October | Low | 20 | 39.1 | (10-68.2) | 0-42.4 | 30.0 | 30 |
| Year 1 | Mean | 76.6 | (41.5-111.7) | 8.8-121.3 | 60.0 | 60 |
| Year 1 | High | 137.7 | (103.7-171.7) | 87.8-187.8 | 80.0 | 90 |
| Year 1 | November | Low | 14 | 35.9 | (11.1-60.7) | 0-83 | 35.7 | 36 |
| Year 1 | Mean | 72.8 | (44.5-101.1) | 24-114.9 | 71.4 | 71 |
| Year 1 | High | 119.7 | (85.1-154.3) | 83.2-169.9 | 78.6 | 79 |
| Year 1 | December | Low | 1 | 10.2 | (NA-NA) | 10.2-10.2 | 0.0 | 0 |
| Year 1 | Mean | 60.7 | (NA-NA) | 60.7-60.7 | 100.0 | 100 |
| Year 1 | High | 105.7 | (NA-NA) | 105.7-105.7 | 100.0 | 100 |

Table : Mean height and proportion (%) of gannet at PCH in 2at site 1. For flight heights both the mean and the interquartile range (IQR), i.e. the middle 50% of the data, are reported for each of the bootstrapped flight height scenarios.

|  | | | | | | | **Proportion of birds at PCH  (%)** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Year** | **Month** | **Scenario** | **Sample Size  (n)** | **Mean bootstrapped  height estimate  (m)** | **+/- 95% CI** | **Inter-quartile  range** | **Small Scenario  (32 - 252m)** | **Large scenario  (32 - 322m)** |
| Year 2 | March | Low | 9 | 4.5 | (-3.9-12.9) | 0-0 | 11.1 | 11 |
| Year 2 | Mean | 28.5 | (3.9-53.1) | 0-28.9 | 22.2 | 22 |
| Year 2 | High | 75.0 | (30.2-119.8) | 0.1-132.5 | 55.6 | 56 |
| Year 2 | April | Low | 24 | 32.4 | (5.3-59.5) | 0-0 | 20.8 | 21 |
| Year 2 | Mean | 71.4 | (41.1-101.7) | 24.7-66.5 | 58.3 | 62 |
| Year 2 | High | 145.1 | (119.2-171) | 102.5-167.8 | 87.5 | 100 |
| Year 2 | May | Low | 56 | 25.6 | (8.6-42.6) | 0-0 | 14.3 | 14 |
| Year 2 | Mean | 56.5 | (37.5-75.5) | 7.3-63.7 | 48.2 | 52 |
| Year 2 | High | 121.8 | (102.8-140.8) | 79.3-149.6 | 83.9 | 89 |
| Year 2 | June | Low | 29 | 37.1 | (12.7-61.5) | 0-10.7 | 24.1 | 24 |
| Year 2 | Mean | 59.0 | (29.7-88.3) | 0.8-65.1 | 37.9 | 38 |
| Year 2 | High | 97.2 | (65.5-128.9) | 25.1-116.1 | 65.5 | 69 |
| Year 2 | July | Low | 85 | 8.1 | (2.2-14) | 0-0 | 9.4 | 9 |
| Year 2 | Mean | 24.4 | (16.9-31.9) | 2.3-31.1 | 23.5 | 24 |
| Year 2 | High | 60.5 | (50.7-70.3) | 27.1-87.8 | 68.2 | 69 |
| Year 2 | August | Low | 38 | 12.7 | (5.3-20.1) | 0-11.3 | 15.8 | 16 |
| Year 2 | Mean | 45.8 | (34.2-57.4) | 17.7-65.9 | 55.3 | 55 |
| Year 2 | High | 95.5 | (80.8-110.2) | 65.6-125.2 | 89.5 | 89 |
| Year 2 | September | Low | 46 | 78.7 | (50.9-106.5) | 0-185 | 41.3 | 41 |
| Year 2 | Mean | 105.4 | (75-135.8) | 5.4-230 | 56.5 | 59 |
| Year 2 | High | 152.7 | (123.2-182.2) | 59.4-264.4 | 50.0 | 83 |
| Year 2 | October | Low | 17 | 44.9 | (10.1-79.7) | 0-84.3 | 29.4 | 29 |
| Year 2 | Mean | 65.3 | (25.9-104.7) | 4.6-111.9 | 41.2 | 41 |
| Year 2 | High | 104.2 | (63.3-145.1) | 32.4-162.1 | 70.6 | 76 |
| Year 2 | November | Low | 40 | 40.7 | (18.8-62.6) | 0-68.6 | 30.0 | 32 |
| Year 2 | Mean | 83.7 | (60-107.4) | 21.1-123.6 | 65.0 | 68 |
| Year 2 | High | 141.8 | (118.5-165.1) | 97.1-176.6 | 82.5 | 92 |
| Year 2 | February | Low | 4 | 0.8 | (-0.2-1.8) | 0-1.2 | 0.0 | 0 |
| Year 2 | Mean | 50.4 | (-0.1-100.9) | 6.9-94.9 | 50.0 | 50 |
| Year 2 | High | 113.9 | (50.5-177.3) | 64.6-166 | 100.0 | 100 |

Table : Mean height and proportion (%) of gannet at PCH in 1at site 2. For flight heights both the mean and the interquartile range (IQR), i.e. the middle 50% of the data, are reported for each of the bootstrapped flight height scenarios.

|  | | | | | | | **Proportion of birds at PCH  (%)** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Year** | **Month** | **Scenario** | **Sample Size  (n)** | **Mean bootstrapped  height estimate  (m)** | **+/- 95% CI** | **Inter-quartile  range** | **Small Scenario  (32 - 252m)** | **Large scenario  (32 - 322m)** |
| Year 1 | March | Low | 15 | 15.1 | (-7.6-37.8) | 0-0 | 13.3 | 13 |
| Year 1 | Mean | 35.7 | (6.7-64.7) | 2.6-43.9 | 40.0 | 40 |
| Year 1 | High | 81.0 | (46.1-115.9) | 32.6-101.2 | 66.7 | 73 |
| Year 1 | May | Low | 51 | 46.1 | (23.5-68.7) | 0-55.5 | 25.5 | 25 |
| Year 1 | Mean | 73.5 | (49-98) | 8.8-126.7 | 39.2 | 45 |
| Year 1 | High | 133.0 | (110.8-155.2) | 76.7-190.2 | 80.4 | 96 |
| Year 1 | June | Low | 71 | 31.2 | (14.4-48) | 0-0 | 18.3 | 18 |
| Year 1 | Mean | 64.4 | (46.2-82.6) | 18.3-62.9 | 46.5 | 51 |
| Year 1 | High | 133.0 | (116.6-149.4) | 91-154 | 87.3 | 99 |
| Year 1 | July | Low | 177 | 24.2 | (14.9-33.5) | 0-0 | 13.6 | 14 |
| Year 1 | Mean | 55.2 | (44.9-65.5) | 10.9-61.3 | 44.1 | 46 |
| Year 1 | High | 119.5 | (109.5-129.5) | 76.7-141 | 83.6 | 93 |
| Year 1 | August | Low | 149 | 15.0 | (7.4-22.6) | 0-0 | 9.4 | 10 |
| Year 1 | Mean | 39.1 | (29.5-48.7) | 4.6-45.4 | 31.5 | 33 |
| Year 1 | High | 93.6 | (83.1-104.1) | 50.4-126.8 | 78.5 | 83 |
| Year 1 | September | Low | 172 | 21.0 | (14.1-27.9) | 0-18.5 | 20.3 | 21 |
| Year 1 | Mean | 41.8 | (33.4-50.2) | 2-60.3 | 41.3 | 42 |
| Year 1 | High | 82.5 | (73.2-91.8) | 35.9-114.8 | 76.7 | 78 |
| Year 1 | October | Low | 67 | 31.8 | (19-44.6) | 0-55.7 | 26.9 | 27 |
| Year 1 | Mean | 59.8 | (45.2-74.4) | 11.2-97.7 | 55.2 | 55 |
| Year 1 | High | 106.1 | (90.4-121.8) | 65.1-150.5 | 82.1 | 82 |
| Year 1 | November | Low | 4 | 74.0 | (35.9-112.1) | 68-90.6 | 75.0 | 75 |
| Year 1 | Mean | 109.9 | (65.5-154.3) | 102-129.5 | 100.0 | 100 |
| Year 1 | High | 143.7 | (96.8-190.6) | 133.5-166.8 | 100.0 | 100 |

Table : Mean height and proportion (%) of gannet at PCH in 2at site 2. For flight heights both the mean and the interquartile range (IQR), i.e. the middle 50% of the data, are reported for each of the bootstrapped flight height scenarios.

|  | | | | | | | **Proportion of birds at PCH  (%)** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Year** | **Month** | **Scenario** | **Sample Size  (n)** | **Mean bootstrapped  height estimate  (m)** | **+/- 95% CI** | **Inter-quartile  range** | **Small Scenario  (32 - 252m)** | **Large scenario  (32 - 322m)** |
| Year 2 | March | Low | 14 | 10.5 | (-10.1-31.1) | 0-0 | 7.1 | 7 |
| Year 2 | Mean | 43.7 | (19.4-68) | 12.9-68.1 | 42.9 | 43 |
| Year 2 | High | 121.3 | (95.4-147.2) | 87-165.6 | 100.0 | 100 |
| Year 2 | April | Low | 48 | 38.2 | (16.4-60) | 0-0.1 | 18.8 | 21 |
| Year 2 | Mean | 80.5 | (57.9-103.1) | 27.5-97 | 64.6 | 67 |
| Year 2 | High | 152.2 | (132.6-171.8) | 115.1-184.2 | 81.2 | 98 |
| Year 2 | May | Low | 75 | 30.0 | (14.2-45.8) | 0-0 | 18.7 | 19 |
| Year 2 | Mean | 55.6 | (38-73.2) | 4.6-61.6 | 36.0 | 39 |
| Year 2 | High | 116.7 | (99.4-134) | 57.7-151.7 | 80.0 | 89 |
| Year 2 | June | Low | 41 | 59.7 | (35.6-83.8) | 0-138.7 | 39.0 | 39 |
| Year 2 | Mean | 84.6 | (57-112.2) | 5.5-175.9 | 51.2 | 51 |
| Year 2 | High | 127.5 | (100.9-154.1) | 61-209.4 | 78.0 | 83 |
| Year 2 | July | Low | 132 | 18.2 | (13.1-23.3) | 0-27.2 | 21.2 | 21 |
| Year 2 | Mean | 46.1 | (39.9-52.3) | 16.5-73.6 | 58.3 | 58 |
| Year 2 | High | 89.2 | (82.1-96.3) | 70-119.2 | 90.2 | 90 |
| Year 2 | August | Low | 92 | 19.9 | (13.1-26.7) | 0-35 | 26.1 | 26 |
| Year 2 | Mean | 54.1 | (44.7-63.5) | 14.3-83.1 | 57.6 | 58 |
| Year 2 | High | 98.3 | (85.8-110.8) | 55.9-128.2 | 83.7 | 85 |
| Year 2 | September | Low | 120 | 32.5 | (20.6-44.4) | 0-0 | 21.7 | 22 |
| Year 2 | Mean | 62.4 | (48.6-76.2) | 7.7-67.9 | 50.0 | 52 |
| Year 2 | High | 120.7 | (107.1-134.3) | 70-147 | 80.0 | 90 |
| Year 2 | October | Low | 16 | 19.5 | (-1.9-40.9) | 0-1.1 | 18.8 | 19 |
| Year 2 | Mean | 41.4 | (9.2-73.6) | 1.5-39.6 | 31.2 | 31 |
| Year 2 | High | 90.0 | (54.7-125.3) | 26.8-123.3 | 68.8 | 69 |
| Year 2 | November | Low | 56 | 17.1 | (5.3-28.9) | 0-0.3 | 12.5 | 12 |
| Year 2 | Mean | 58.3 | (44-72.6) | 21.7-72.6 | 60.7 | 61 |
| Year 2 | High | 122.4 | (108-136.8) | 89.4-148.9 | 94.6 | 96 |
| Year 2 | December | Low | 7 | 43.0 | (4.4-81.6) | 0-88.8 | 42.9 | 43 |
| Year 2 | Mean | 81.6 | (37.5-125.7) | 44.3-123 | 71.4 | 71 |
| Year 2 | High | 124.2 | (70.7-177.7) | 91.6-174.6 | 85.7 | 86 |
| Year 2 | January | Low | 3 | 0.7 | (-0.8-2.2) | 0-1.1 | 0.0 | 0 |
| Year 2 | Mean | 27.0 | (-26-80) | 0-40.6 | 33.3 | 33 |
| Year 2 | High | 46.1 | (-43.2-135.4) | 0.6-69.2 | 33.3 | 33 |

#### Flight height ranges

For interpretation of the following graphs, see Section 3.2.

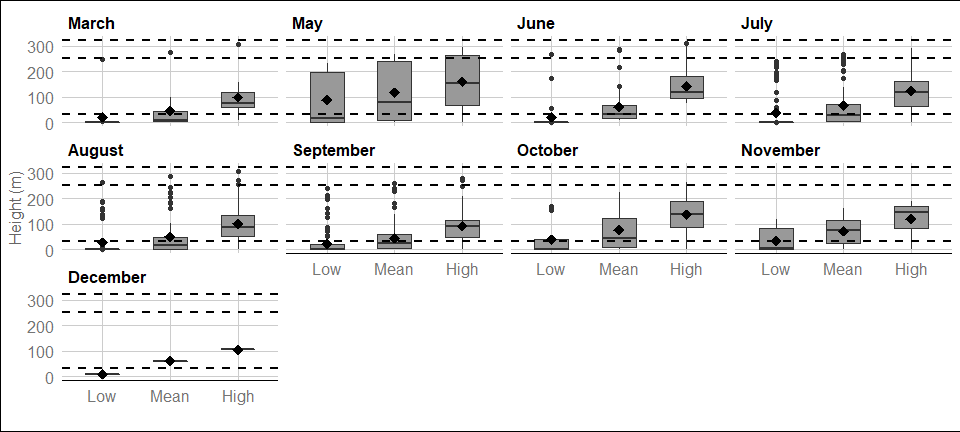


Figure : Distribution of gannet flight heights from minimum (2.5th percentile), mean and maximum (97.5th percentile) bootstrapped estimates in Year 1 at site SG2. The mean of the population for each distribution is indicated by the black dot, and the middle line represents the median. The grey boxes represent the middle 50% of the data. The dotted lines indicate the minimum and maximum rotor heights of both wind turbine scenarios.

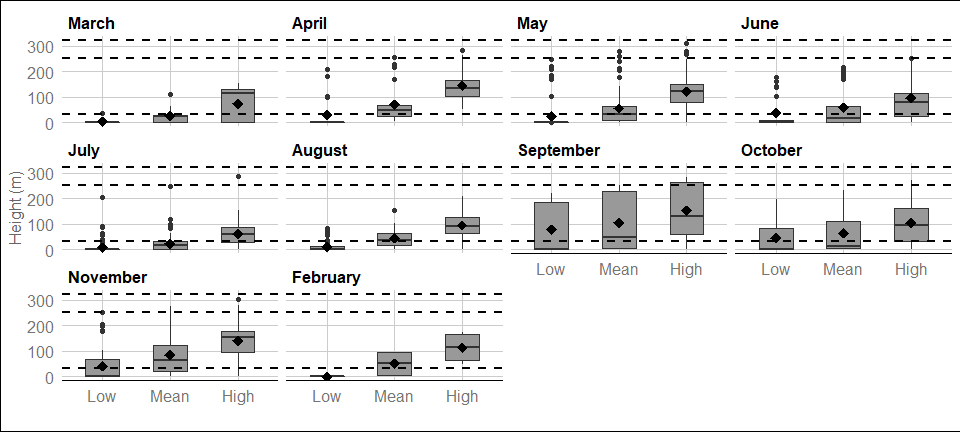


Figure : Distribution of gannet flight heights from minimum (2.5th percentile), mean and maximum (97.5th percentile) bootstrapped estimates in Year 2 at site SG2. The mean of the population for each distribution is indicated by the black dot, and the middle line represents the median. The grey boxes represent the middle 50% of the data. The dotted lines indicate the minimum and maximum rotor heights of both wind turbine scenarios.

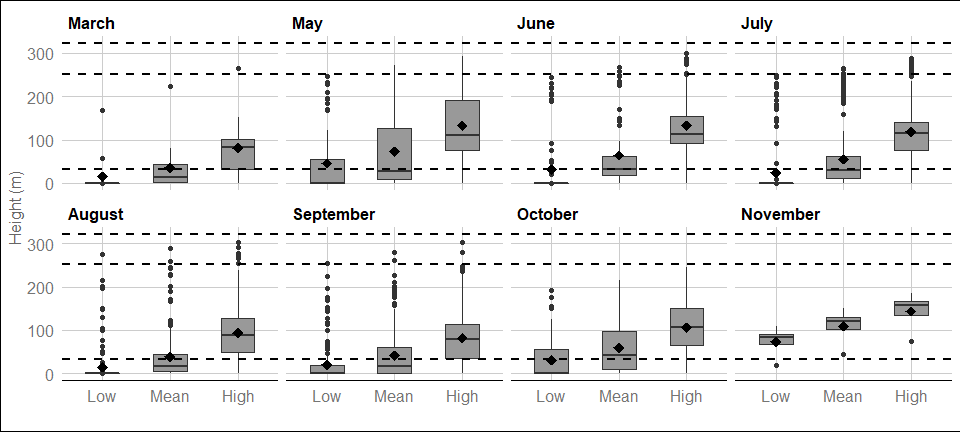


Figure : Distribution of gannet flight heights from minimum (2.5th percentile), mean and maximum (97.5th percentile) bootstrapped estimates in Year 1 at site SG3. The mean of the population for each distribution is indicated by the black dot, and the middle line represents the median. The grey boxes represent the middle 50% of the data. The dotted lines indicate the minimum and maximum rotor heights of both wind turbine scenarios.

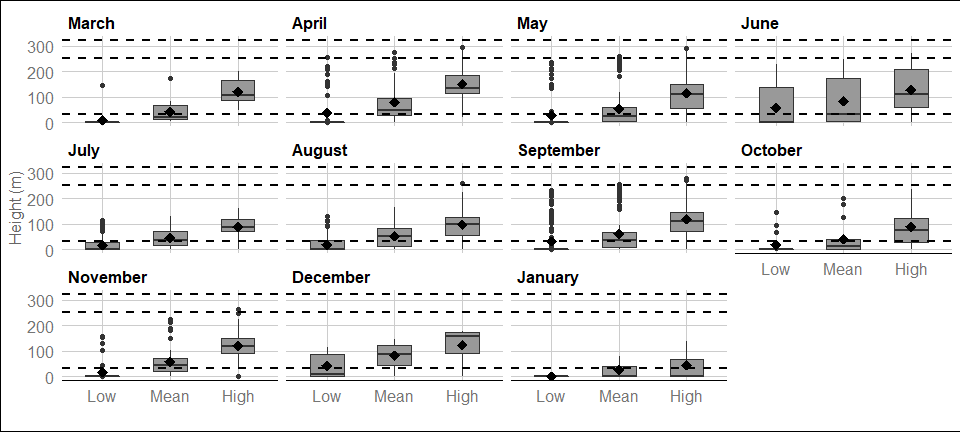


Figure : Distribution of gannet flight heights from minimum (2.5th percentile), mean and maximum (97.5th percentile) bootstrapped estimates in Year 2 at site SG3. The mean of the population for each distribution is indicated by the black dot, and the middle line represents the median. The grey boxes represent the middle 50% of the data. The dotted lines indicate the minimum and maximum rotor heights of both wind turbine scenarios.

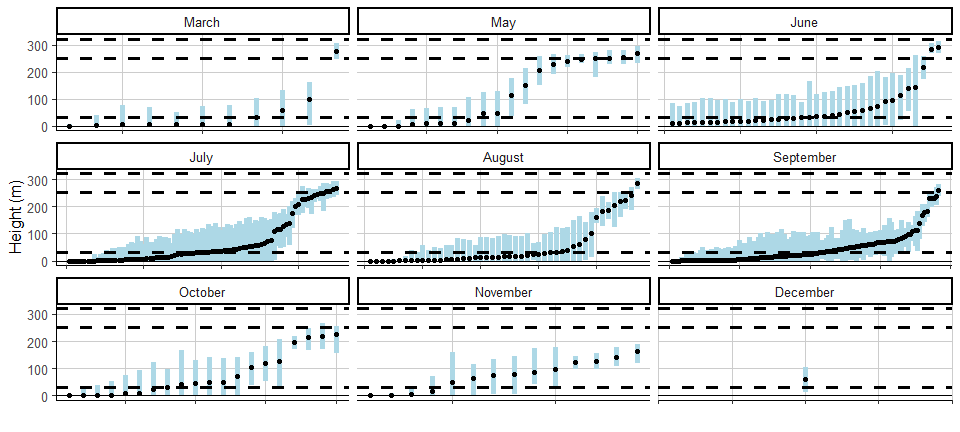


Figure : Ordered height estimates of individual gannet in the survey area with minimum and maximum potential height range for both smallest and largest turbine specifications in Year 1 at site SG2.

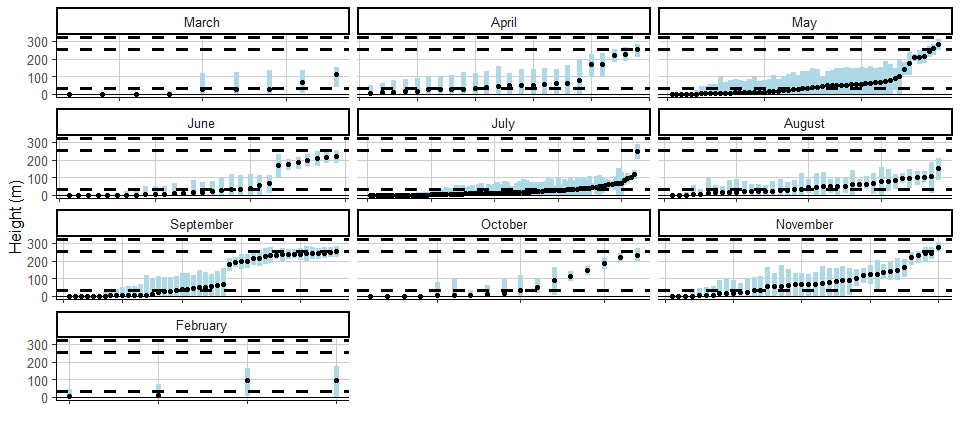


Figure : Ordered height estimates of individual gannet in the survey area with minimum and maximum potential height range for both smallest and largest turbine specifications in Year 2 at site SG2.

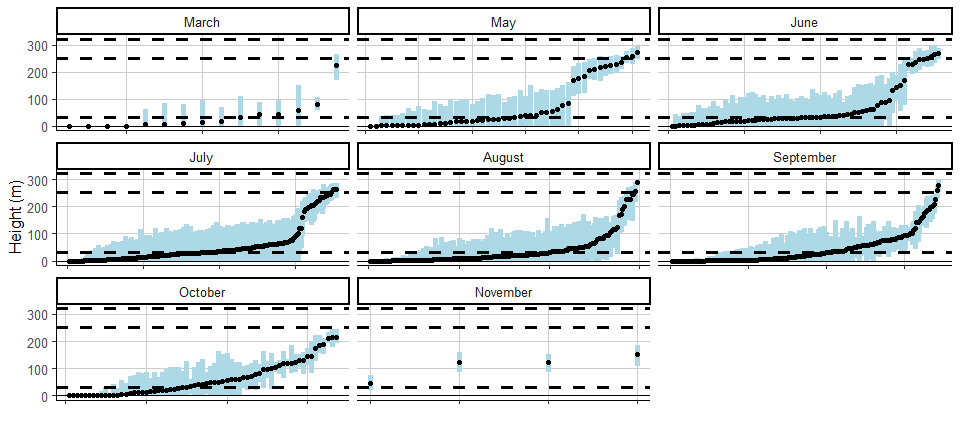


Figure : Ordered height estimates of individual gannet in the survey area with minimum and maximum potential height range for both smallest and largest turbine specifications in Year 1 at site SG3.

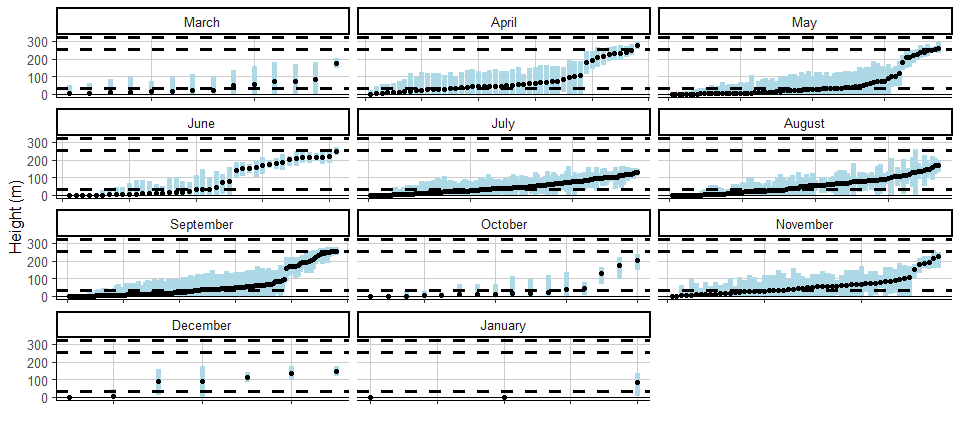


Figure : Ordered height estimates of individual gannet in the survey area with minimum and maximum potential height range for both smallest and largest turbine specifications in Year 2 at site SG3.

#### Spatial variation in flight height

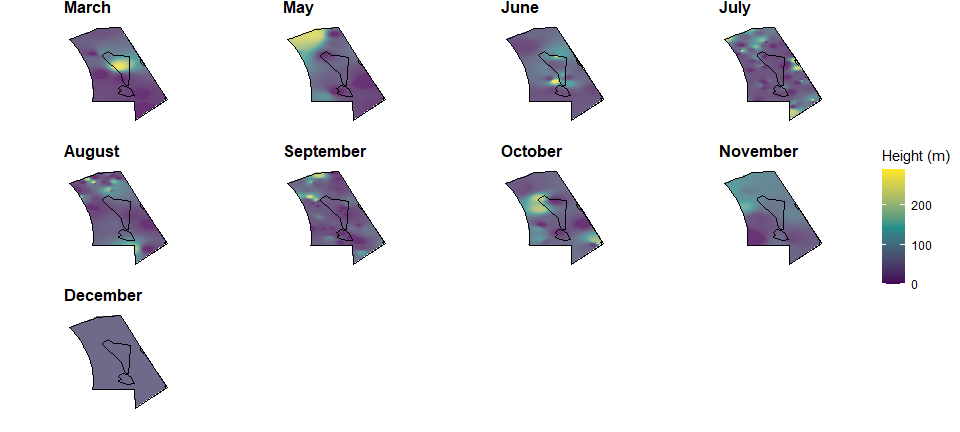


Figure : Two-dimensional spatial variation in estimated mean flight heights of gannet in Year 1 at site SG2. Flight height estimates were derived using an inverse distance weighted interpolation. Grey plots indicate months were no birds of this species were recorded.

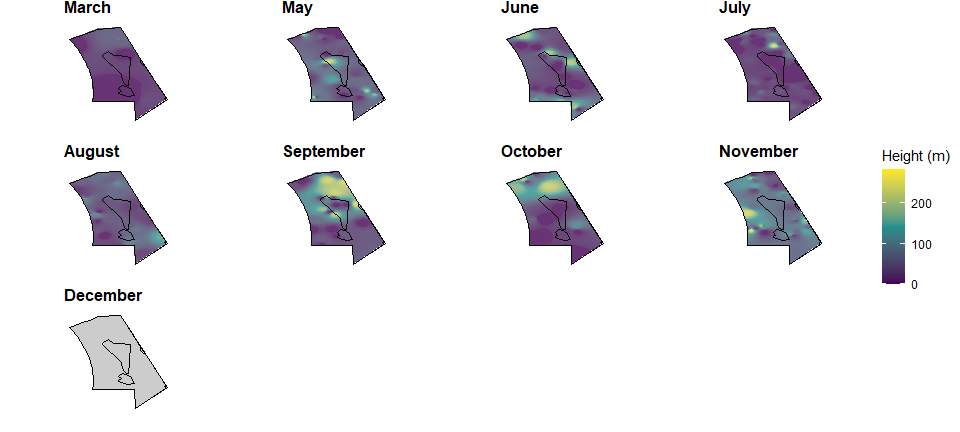


Figure : Two-dimensional spatial variation in estimated mean flight heights of gannet in Year 2 at site SG2. Flight height estimates were derived using an inverse distance weighted interpolation. Grey plots indicate months were no birds of this species were recorded.

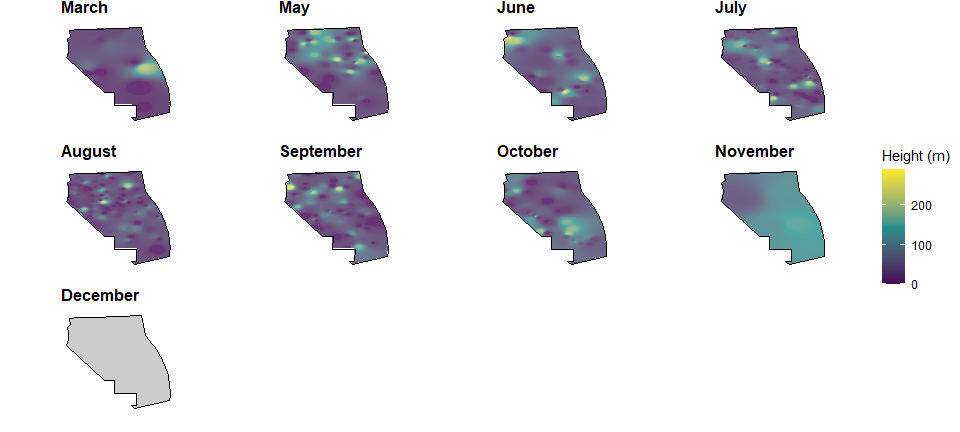


Figure : Two-dimensional spatial variation in estimated mean flight heights of gannet in Year 1 at site SG3. Flight height estimates were derived using an inverse distance weighted interpolation. Grey plots indicate months were no birds of this species were recorded.

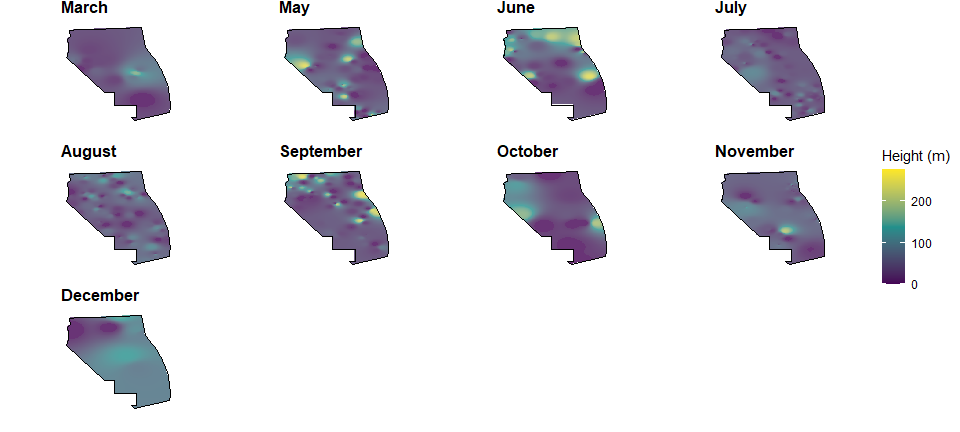


Figure : Two-dimensional spatial variation in estimated mean flight heights of gannet in Year 2 at site SG3. Flight height estimates were derived using an inverse distance weighted interpolation. Grey plots indicate months were no birds of this species were recorded.

### Lesser black-backed gull

#### Proportion of birds at PCH

Table : Mean height and proportion (%) of lesser black-backed gull at PCH in 1at site 1. For flight heights both the mean and the interquartile range (IQR), i.e. the middle 50% of the data, are reported for each of the bootstrapped flight height scenarios.

|  | | | | | | | **Proportion of birds at PCH  (%)** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Year** | **Month** | **Scenario** | **Sample Size  (n)** | **Mean bootstrapped  height estimate  (m)** | **+/- 95% CI** | **Inter-quartile  range** | **Small Scenario  (32 - 252m)** | **Large scenario  (32 - 322m)** |
| Year 1 | June | Low | 3 | 18.8 | (-18-55.6) | 0-28.2 | 33.3 | 33 |
| Year 1 | Mean | 56.2 | (1.2-111.2) | 29.9-77.8 | 66.7 | 67 |
| Year 1 | High | 119.6 | (85-154.2) | 103.3-133.7 | 100.0 | 100 |
| Year 1 | July | Low | 5 | 0.0 | (0-0) | 0-0 | 0.0 | 0 |
| Year 1 | Mean | 43.4 | (20.2-66.6) | 35.5-54.4 | 80.0 | 80 |
| Year 1 | High | 119.8 | (86.9-152.7) | 109.2-134.2 | 100.0 | 100 |
| Year 1 | August | Low | 1 | 0.5 | (NA-NA) | 0.5-0.5 | 0.0 | 0 |
| Year 1 | Mean | 44.3 | (NA-NA) | 44.3-44.3 | 100.0 | 100 |
| Year 1 | High | 100.1 | (NA-NA) | 100.1-100.1 | 100.0 | 100 |

Table : Mean height and proportion (%) of lesser black-backed gull at PCH in 2at site 1. For flight heights both the mean and the interquartile range (IQR), i.e. the middle 50% of the data, are reported for each of the bootstrapped flight height scenarios.

|  | | | | | | | **Proportion of birds at PCH  (%)** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Year** | **Month** | **Scenario** | **Sample Size  (n)** | **Mean bootstrapped  height estimate  (m)** | **+/- 95% CI** | **Inter-quartile  range** | **Small Scenario  (32 - 252m)** | **Large scenario  (32 - 322m)** |
| Year 2 | July | Low | 9 | 12.3 | (-5.6-30.2) | 0-0.7 | 11.1 | 11 |
| Year 2 | Mean | 24.8 | (-3.4-53) | 0-26.9 | 22.2 | 22 |
| Year 2 | High | 40.0 | (3.2-76.8) | 0-58.6 | 44.4 | 44 |
| Year 2 | August | Low | 2 | 16.1 | (-15.5-47.7) | 8.1-24.2 | 50.0 | 50 |
| Year 2 | Mean | 80.0 | (-18.9-178.9) | 54.8-105.2 | 50.0 | 50 |
| Year 2 | High | 152.9 | (59.3-246.5) | 129-176.8 | 100.0 | 100 |

Table : Mean height and proportion (%) of lesser black-backed gull at PCH in 1at site 2. For flight heights both the mean and the interquartile range (IQR), i.e. the middle 50% of the data, are reported for each of the bootstrapped flight height scenarios.

|  | | | | | | | **Proportion of birds at PCH  (%)** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Year** | **Month** | **Scenario** | **Sample Size  (n)** | **Mean bootstrapped  height estimate  (m)** | **+/- 95% CI** | **Inter-quartile  range** | **Small Scenario  (32 - 252m)** | **Large scenario  (32 - 322m)** |
| Year 1 | June | Low | 1 | 0.0 | (NA-NA) | 0-0 | 0.0 | 0 |
| Year 1 | Mean | 28.1 | (NA-NA) | 28.1-28.1 | 0.0 | 0 |
| Year 1 | High | 142.6 | (NA-NA) | 142.6-142.6 | 100.0 | 100 |
| Year 1 | July | Low | 6 | 50.0 | (-12.8-112.8) | 0-97.4 | 33.3 | 33 |
| Year 1 | Mean | 90.3 | (17.3-163.3) | 26.3-154.7 | 66.7 | 67 |
| Year 1 | High | 166.4 | (103.4-229.4) | 118.5-221.4 | 83.3 | 100 |
| Year 1 | August | Low | 4 | 10.2 | (-9.7-30.1) | 0-10.2 | 25.0 | 25 |
| Year 1 | Mean | 52.4 | (-10.6-115.4) | 3.6-85.2 | 50.0 | 50 |
| Year 1 | High | 109.4 | (10.3-208.5) | 40.4-176.1 | 75.0 | 75 |

Table : Mean height and proportion (%) of lesser black-backed gull at PCH in 2at site 2. For flight heights both the mean and the interquartile range (IQR), i.e. the middle 50% of the data, are reported for each of the bootstrapped flight height scenarios.

|  | | | | | | | **Proportion of birds at PCH  (%)** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Year** | **Month** | **Scenario** | **Sample Size  (n)** | **Mean bootstrapped  height estimate  (m)** | **+/- 95% CI** | **Inter-quartile  range** | **Small Scenario  (32 - 252m)** | **Large scenario  (32 - 322m)** |
| Year 2 | July | Low | 14 | 12.0 | (-3-27) | 0-5.4 | 14.3 | 14 |
| Year 2 | Mean | 39.6 | (19.7-59.5) | 3.5-59.3 | 57.1 | 57 |
| Year 2 | High | 81.5 | (51-112) | 23.3-126.6 | 71.4 | 71 |
| Year 2 | August | Low | 8 | 26.6 | (2.9-50.3) | 0-57.8 | 37.5 | 38 |
| Year 2 | Mean | 55.6 | (27.2-84) | 26-90.6 | 62.5 | 62 |
| Year 2 | High | 92.3 | (59.3-125.3) | 73.5-117.8 | 87.5 | 88 |

#### Flight height ranges

For interpretation of the following graphs, see Section 3.2.

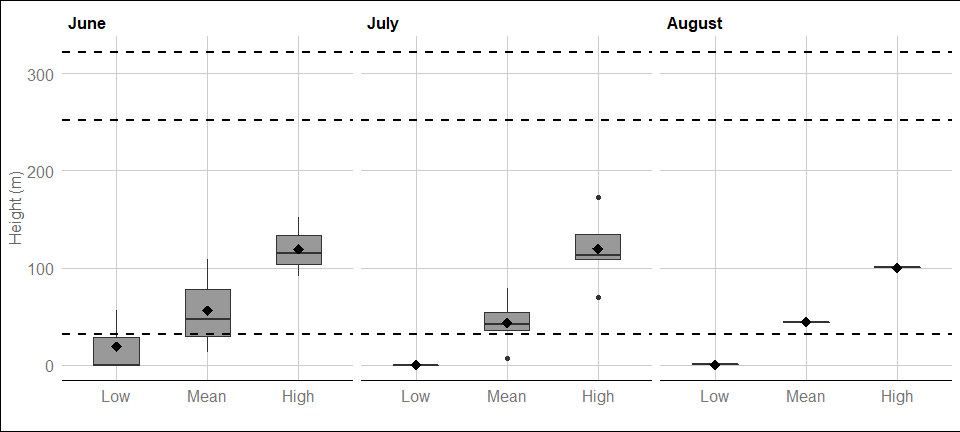


Figure : Distribution of lesser black-backed gull flight heights from minimum (2.5th percentile), mean and maximum (97.5th percentile) bootstrapped estimates in Year 1 at site SG2. The mean of the population for each distribution is indicated by the black dot, and the middle line represents the median. The grey boxes represent the middle 50% of the data. The dotted lines indicate the minimum and maximum rotor heights of both wind turbine scenarios.

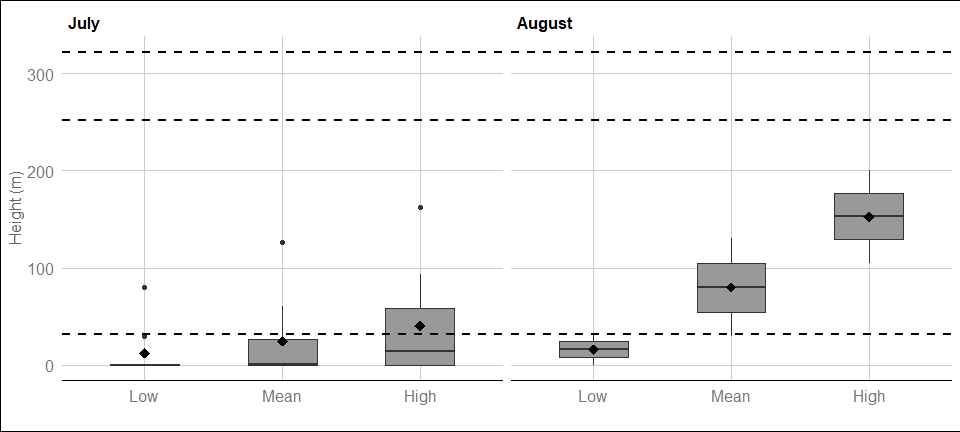


Figure : Distribution of lesser black-backed gull flight heights from minimum (2.5th percentile), mean and maximum (97.5th percentile) bootstrapped estimates in Year 2 at site SG2. The mean of the population for each distribution is indicated by the black dot, and the middle line represents the median. The grey boxes represent the middle 50% of the data. The dotted lines indicate the minimum and maximum rotor heights of both wind turbine scenarios.

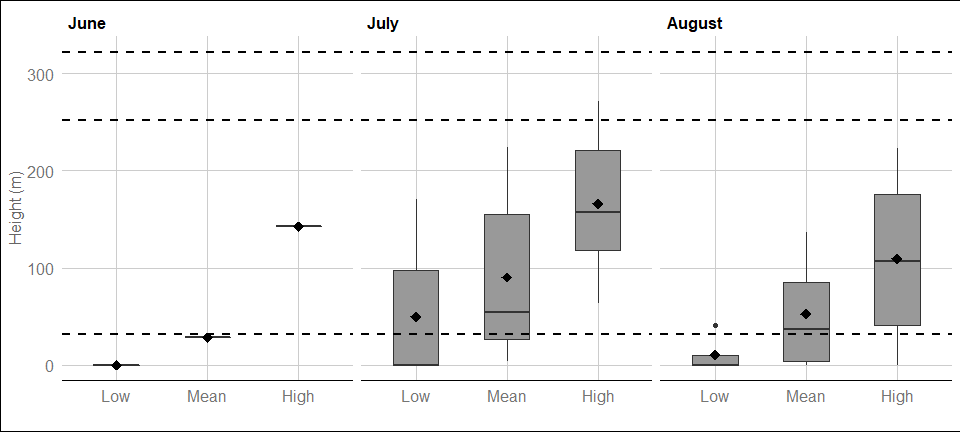


Figure : Distribution of lesser black-backed gull flight heights from minimum (2.5th percentile), mean and maximum (97.5th percentile) bootstrapped estimates in Year 1 at site SG3. The mean of the population for each distribution is indicated by the black dot, and the middle line represents the median. The grey boxes represent the middle 50% of the data. The dotted lines indicate the minimum and maximum rotor heights of both wind turbine scenarios.

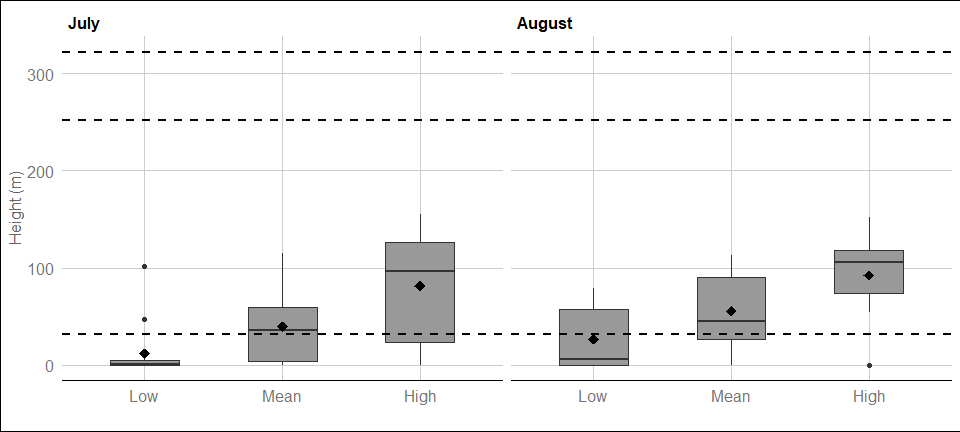


Figure : Distribution of lesser black-backed gull flight heights from minimum (2.5th percentile), mean and maximum (97.5th percentile) bootstrapped estimates in Year 2 at site SG3. The mean of the population for each distribution is indicated by the black dot, and the middle line represents the median. The grey boxes represent the middle 50% of the data. The dotted lines indicate the minimum and maximum rotor heights of both wind turbine scenarios.

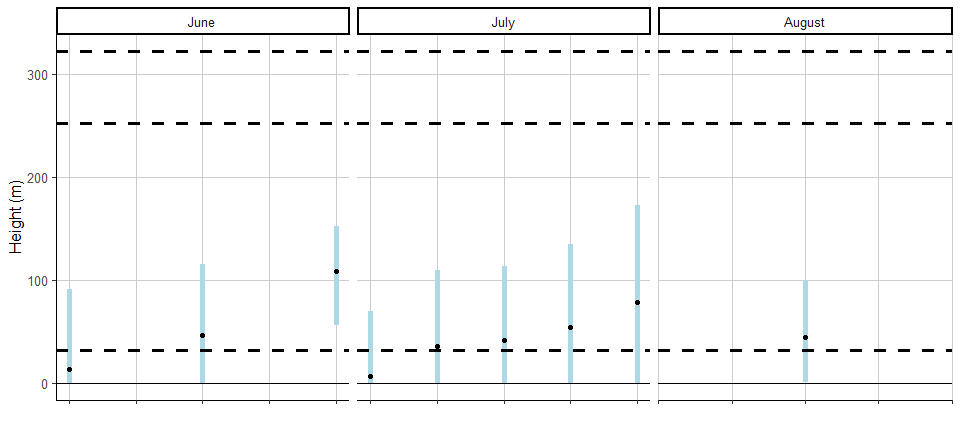


Figure : Ordered height estimates of individual lesser black-backed gull in the survey area with minimum and maximum potential height range for both smallest and largest turbine specifications in Year 1 at site SG2.

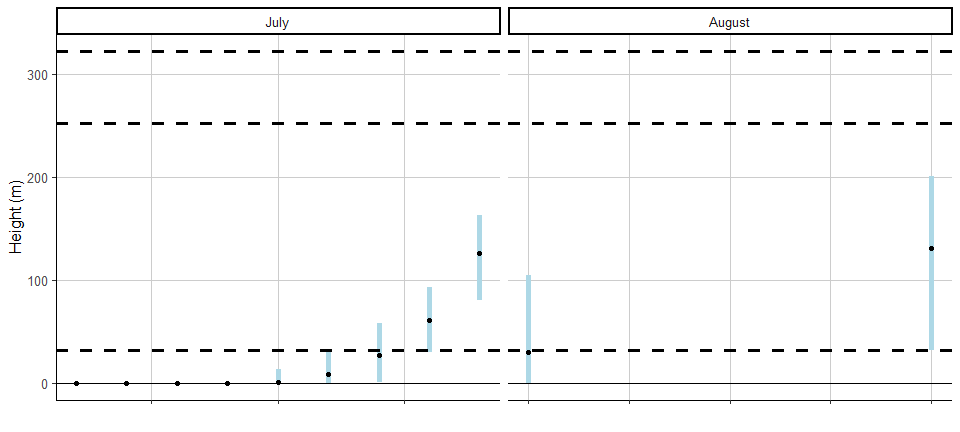


Figure : Ordered height estimates of individual lesser black-backed gull in the survey area with minimum and maximum potential height range for both smallest and largest turbine specifications in Year 2 at site SG2.

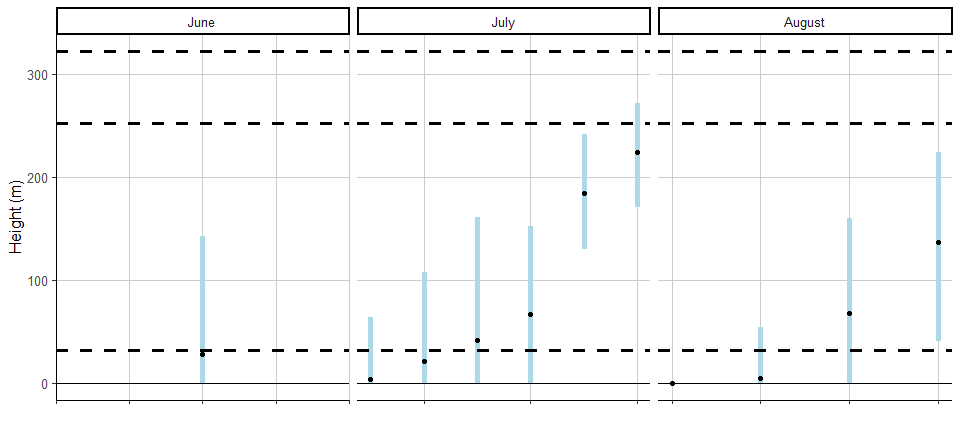


Figure : Ordered height estimates of individual lesser black-backed gull in the survey area with minimum and maximum potential height range for both smallest and largest turbine specifications in Year 1 at site SG3.

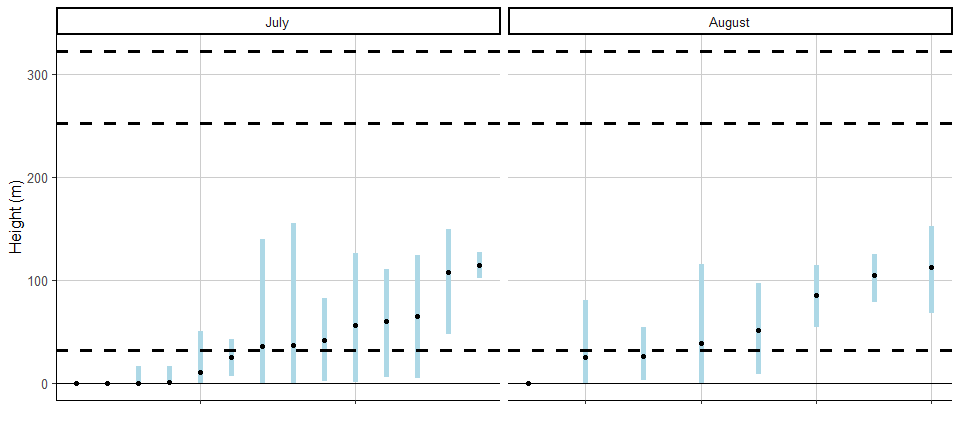


Figure : Ordered height estimates of individual lesser black-backed gull in the survey area with minimum and maximum potential height range for both smallest and largest turbine specifications in Year 2 at site SG3.

#### Spatial variation in flight height

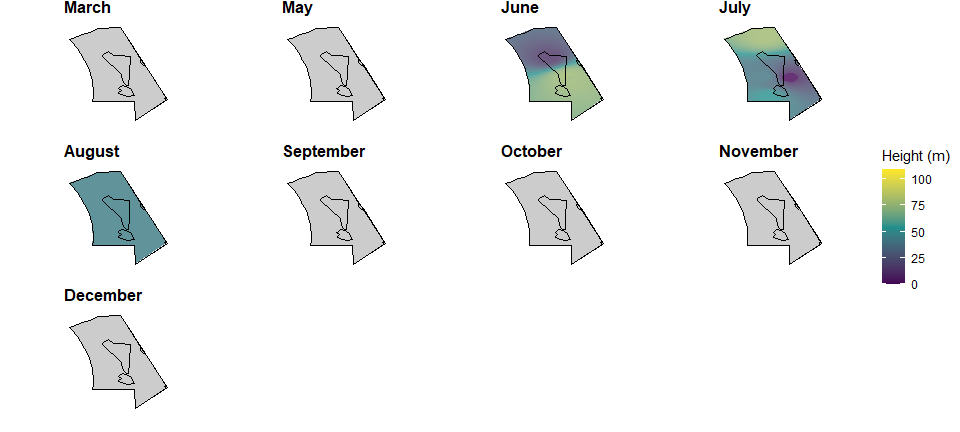


Figure : Two-dimensional spatial variation in estimated mean flight heights of lesser black-backed gull in Year 1 at site SG2. Flight height estimates were derived using an inverse distance weighted interpolation. Grey plots indicate months were no birds of this species were recorded.

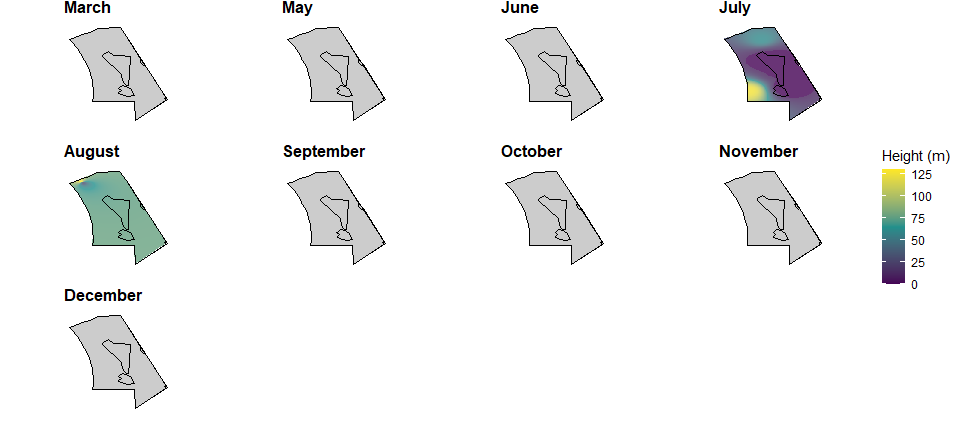


Figure : Two-dimensional spatial variation in estimated mean flight heights of lesser black-backed gull in Year 2 at site SG2. Flight height estimates were derived using an inverse distance weighted interpolation. Grey plots indicate months were no birds of this species were recorded.



Figure : Two-dimensional spatial variation in estimated mean flight heights of lesser black-backed gull in Year 1 at site SG3. Flight height estimates were derived using an inverse distance weighted interpolation. Grey plots indicate months were no birds of this species were recorded.



Figure : Two-dimensional spatial variation in estimated mean flight heights of lesser black-backed gull in Year 2 at site SG3. Flight height estimates were derived using an inverse distance weighted interpolation. Grey plots indicate months were no birds of this species were recorded.

### Herring gull

#### Proportion of birds at PCH

Table : Mean height and proportion (%) of herring gull at PCH in 1at site 1. For flight heights both the mean and the interquartile range (IQR), i.e. the middle 50% of the data, are reported for each of the bootstrapped flight height scenarios.

|  | | | | | | | **Proportion of birds at PCH  (%)** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Year** | **Month** | **Scenario** | **Sample Size  (n)** | **Mean bootstrapped  height estimate  (m)** | **+/- 95% CI** | **Inter-quartile  range** | **Small Scenario  (32 - 252m)** | **Large scenario  (32 - 322m)** |
| Year 1 | March | Low | 1 | 198.1 | (NA-NA) | 198.1-198.1 | 100.0 | 100 |
| Year 1 | Mean | 215.0 | (NA-NA) | 215-215 | 100.0 | 100 |
| Year 1 | High | 232.9 | (NA-NA) | 232.9-232.9 | 100.0 | 100 |
| Year 1 | June | Low | 14 | 44.6 | (-2.6-91.8) | 0-0 | 21.4 | 21 |
| Year 1 | Mean | 72.8 | (20.6-125) | 11.9-45.6 | 35.7 | 50 |
| Year 1 | High | 143.4 | (97.3-189.5) | 97.4-149.7 | 85.7 | 100 |
| Year 1 | July | Low | 4 | 0.0 | (0-0) | 0-0 | 0.0 | 0 |
| Year 1 | Mean | 14.9 | (3.6-26.2) | 7.6-24 | 0.0 | 0 |
| Year 1 | High | 84.8 | (44.5-125.1) | 62.9-113.7 | 100.0 | 100 |
| Year 1 | November | Low | 1 | 0.0 | (NA-NA) | 0-0 | 0.0 | 0 |
| Year 1 | Mean | 3.8 | (NA-NA) | 3.8-3.8 | 0.0 | 0 |
| Year 1 | High | 22.1 | (NA-NA) | 22.1-22.1 | 0.0 | 0 |

Table : Mean height and proportion (%) of herring gull at PCH in 2at site 1. For flight heights both the mean and the interquartile range (IQR), i.e. the middle 50% of the data, are reported for each of the bootstrapped flight height scenarios.

|  | | | | | | | **Proportion of birds at PCH  (%)** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Year** | **Month** | **Scenario** | **Sample Size  (n)** | **Mean bootstrapped  height estimate  (m)** | **+/- 95% CI** | **Inter-quartile  range** | **Small Scenario  (32 - 252m)** | **Large scenario  (32 - 322m)** |
| Year 2 | July | Low | 39 | 8.5 | (-0.7-17.7) | 0-0 | 7.7 | 8 |
| Year 2 | Mean | 22.4 | (8.3-36.5) | 0-14.3 | 15.4 | 15 |
| Year 2 | High | 58.7 | (39.7-77.7) | 11.5-86.5 | 59.0 | 62 |
| Year 2 | August | Low | 1 | 0.0 | (NA-NA) | 0-0 | 0.0 | 0 |
| Year 2 | Mean | 68.4 | (NA-NA) | 68.4-68.4 | 100.0 | 100 |
| Year 2 | High | 172.3 | (NA-NA) | 172.3-172.3 | 100.0 | 100 |
| Year 2 | December | Low | 3 | 53.7 | (-51.5-158.9) | 0-80.5 | 33.3 | 33 |
| Year 2 | Mean | 63.1 | (-60.6-186.8) | 0-94.7 | 33.3 | 33 |
| Year 2 | High | 86.3 | (-44.7-217.3) | 20.6-129.5 | 66.7 | 67 |
| Year 2 | January | Low | 40.5 | (-8.9-89.9) | 17.4-60.7 | 66.7 | 67 |
| Year 2 | Mean | 86.5 | (-0.5-173.5) | 55.8-129.7 | 66.7 | 67 |
| Year 2 | High | 130.9 | (17.4-244.4) | 95.4-188.3 | 66.7 | 67 |

Table : Mean height and proportion (%) of herring gull at PCH in 1at site 2. For flight heights both the mean and the interquartile range (IQR), i.e. the middle 50% of the data, are reported for each of the bootstrapped flight height scenarios.

|  | | | | | | | **Proportion of birds at PCH  (%)** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Year** | **Month** | **Scenario** | **Sample Size  (n)** | **Mean bootstrapped  height estimate  (m)** | **+/- 95% CI** | **Inter-quartile  range** | **Small Scenario  (32 - 252m)** | **Large scenario  (32 - 322m)** |
| Year 1 | June | Low | 23 | 30.3 | (2.6-58) | 0-1.9 | 17.4 | 17 |
| Year 1 | Mean | 79.3 | (47.9-110.7) | 29.2-115.1 | 60.9 | 65 |
| Year 1 | High | 158.5 | (130.1-186.9) | 127.4-199.7 | 87.0 | 96 |
| Year 1 | July | Low | 18 | 9.0 | (-8.3-26.3) | 0-0 | 5.6 | 6 |
| Year 1 | Mean | 54.3 | (31.6-77) | 24.7-68.3 | 72.2 | 72 |
| Year 1 | High | 140.8 | (116-165.6) | 99.5-176.7 | 94.4 | 100 |
| Year 1 | August | Low | 10 | 58.0 | (19-97) | 0-79.2 | 60.0 | 60 |
| Year 1 | Mean | 124.1 | (73.1-175.1) | 82.6-172.6 | 70.0 | 80 |
| Year 1 | High | 180.6 | (118.6-242.6) | 189.6-233.8 | 70.0 | 80 |
| Year 1 | November | Low | 5 | 39.6 | (-37.5-116.7) | 0-1.2 | 20.0 | 20 |
| Year 1 | Mean | 54.7 | (-33-142.4) | 0-41 | 40.0 | 40 |
| Year 1 | High | 82.3 | (-12.1-176.7) | 0-86.6 | 40.0 | 60 |
| Year 1 | December | Low | 1 | 25.4 | (NA-NA) | 25.4-25.4 | 0.0 | 0 |
| Year 1 | Mean | 83.4 | (NA-NA) | 83.4-83.4 | 100.0 | 100 |
| Year 1 | High | 128.4 | (NA-NA) | 128.4-128.4 | 100.0 | 100 |
| Year 1 | February | Low | 0.0 | (NA-NA) | 0-0 | 0.0 | 0 |
| Year 1 | Mean | 1.0 | (NA-NA) | 1-1 | 0.0 | 0 |
| Year 1 | High | 23.1 | (NA-NA) | 23.1-23.1 | 0.0 | 0 |

Table : Mean height and proportion (%) of herring gull at PCH in 2at site 2. For flight heights both the mean and the interquartile range (IQR), i.e. the middle 50% of the data, are reported for each of the bootstrapped flight height scenarios.

|  | | | | | | | **Proportion of birds at PCH  (%)** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Year** | **Month** | **Scenario** | **Sample Size  (n)** | **Mean bootstrapped  height estimate  (m)** | **+/- 95% CI** | **Inter-quartile  range** | **Small Scenario  (32 - 252m)** | **Large scenario  (32 - 322m)** |
| Year 2 | July | Low | 33 | 13.2 | (4.9-21.5) | 0-9.9 | 18.2 | 18 |
| Year 2 | Mean | 50.6 | (36.6-64.6) | 12.8-87.5 | 57.6 | 58 |
| Year 2 | High | 102.5 | (83.7-121.3) | 64.8-147.1 | 84.8 | 85 |
| Year 2 | August | Low | 14 | 73.9 | (30.6-117.2) | 0.5-158.4 | 50.0 | 50 |
| Year 2 | Mean | 108.2 | (66.3-150.1) | 47-186.8 | 78.6 | 79 |
| Year 2 | High | 160.0 | (124.8-195.2) | 109.9-222.7 | 78.6 | 100 |
| Year 2 | November | Low | 1 | 0.0 | (NA-NA) | 0-0 | 0.0 | 0 |
| Year 2 | Mean | 5.1 | (NA-NA) | 5.1-5.1 | 0.0 | 0 |
| Year 2 | High | 50.5 | (NA-NA) | 50.5-50.5 | 100.0 | 100 |
| Year 2 | December | Low | 9 | 23.6 | (-17.3-64.5) | 0-5.2 | 11.1 | 11 |
| Year 2 | Mean | 51.5 | (2.5-100.5) | 1.2-54.7 | 55.6 | 56 |
| Year 2 | High | 100.3 | (43.2-157.4) | 19.2-125.4 | 55.6 | 67 |

#### Flight height ranges

For interpretation of the following graphs, see Section 3.2.

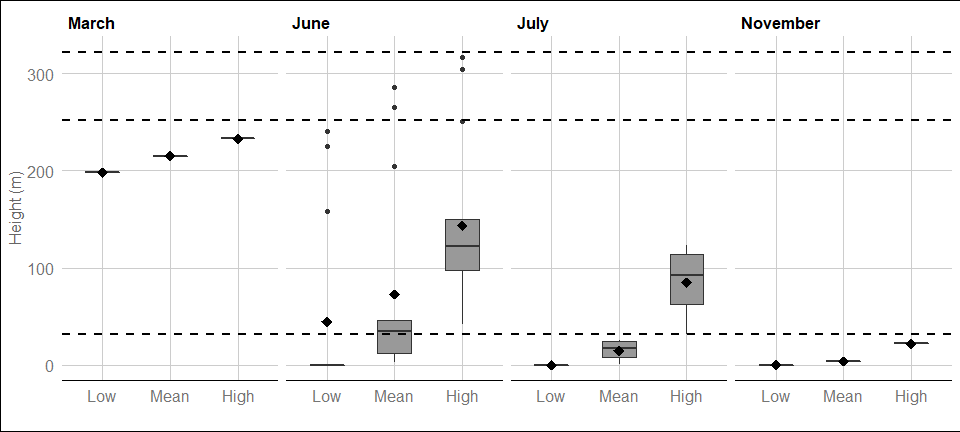


Figure : Distribution of herring gull flight heights from minimum (2.5th percentile), mean and maximum (97.5th percentile) bootstrapped estimates in Year 1 at site SG2. The mean of the population for each distribution is indicated by the black dot, and the middle line represents the median. The grey boxes represent the middle 50% of the data. The dotted lines indicate the minimum and maximum rotor heights of both wind turbine scenarios.

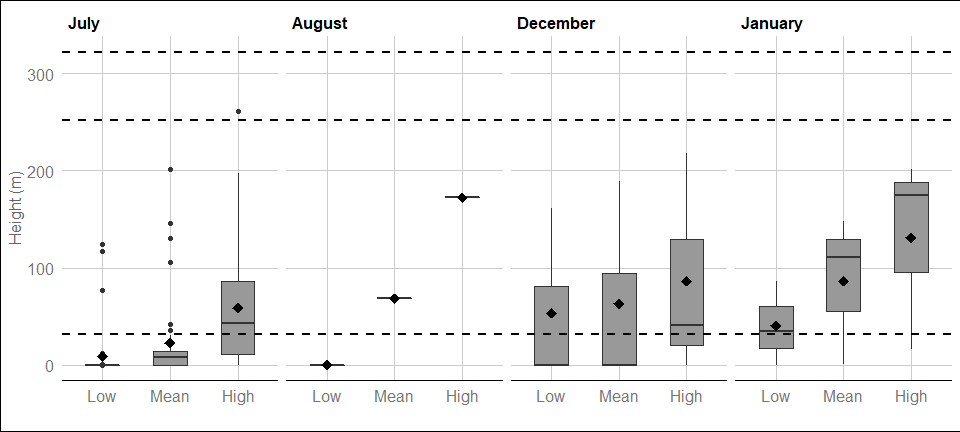


Figure : Distribution of herring gull flight heights from minimum (2.5th percentile), mean and maximum (97.5th percentile) bootstrapped estimates in Year 2 at site SG2. The mean of the population for each distribution is indicated by the black dot, and the middle line represents the median. The grey boxes represent the middle 50% of the data. The dotted lines indicate the minimum and maximum rotor heights of both wind turbine scenarios.

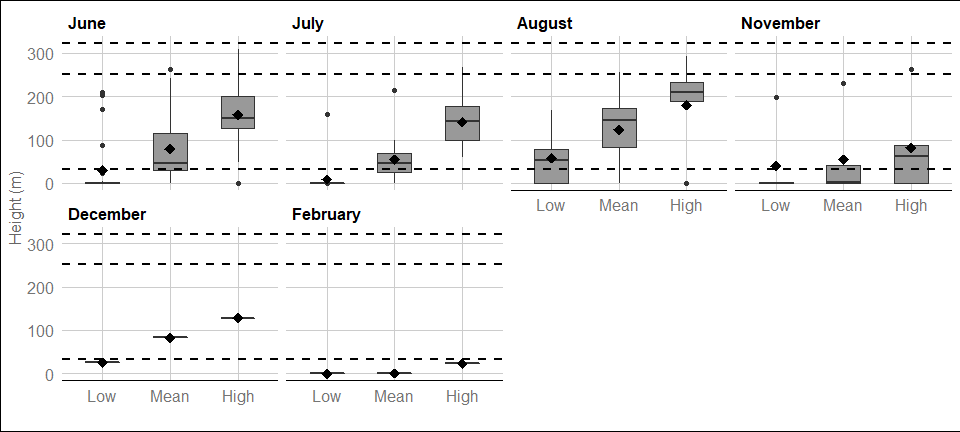


Figure : Distribution of herring gull flight heights from minimum (2.5th percentile), mean and maximum (97.5th percentile) bootstrapped estimates in Year 1 at site SG3. The mean of the population for each distribution is indicated by the black dot, and the middle line represents the median. The grey boxes represent the middle 50% of the data. The dotted lines indicate the minimum and maximum rotor heights of both wind turbine scenarios.

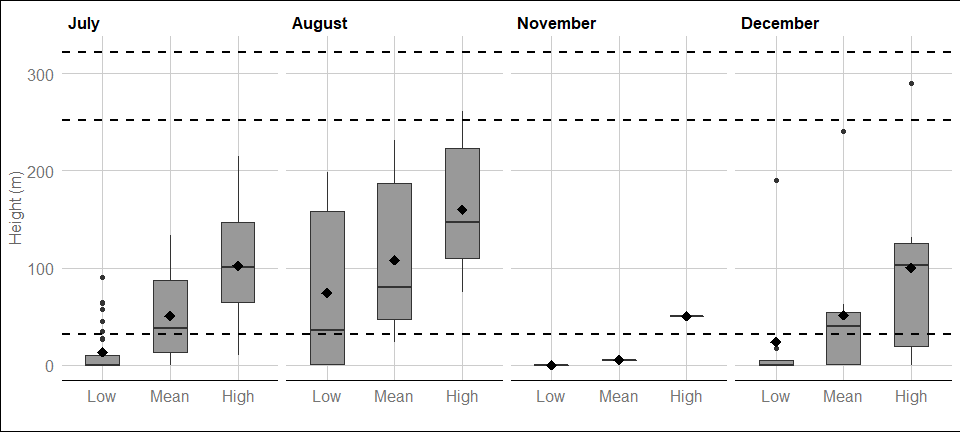


Figure : Distribution of herring gull flight heights from minimum (2.5th percentile), mean and maximum (97.5th percentile) bootstrapped estimates in Year 2 at site SG3. The mean of the population for each distribution is indicated by the black dot, and the middle line represents the median. The grey boxes represent the middle 50% of the data. The dotted lines indicate the minimum and maximum rotor heights of both wind turbine scenarios.

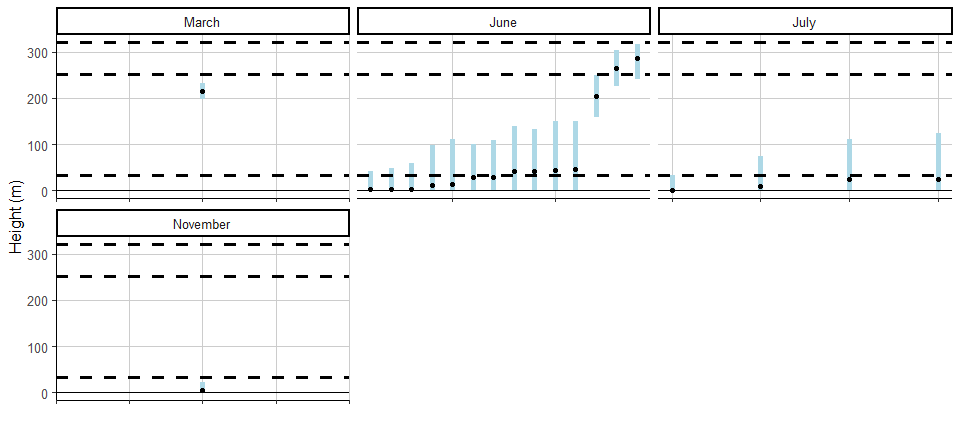


Figure : Ordered height estimates of individual herring gull in the survey area with minimum and maximum potential height range for both smallest and largest turbine specifications in Year 1 at site SG2.

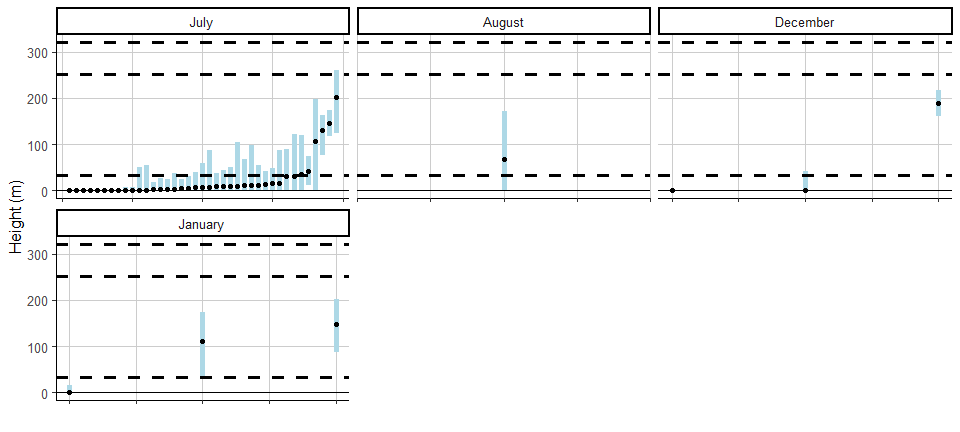


Figure : Ordered height estimates of individual herring gull in the survey area with minimum and maximum potential height range for both smallest and largest turbine specifications in Year 2 at site SG2.

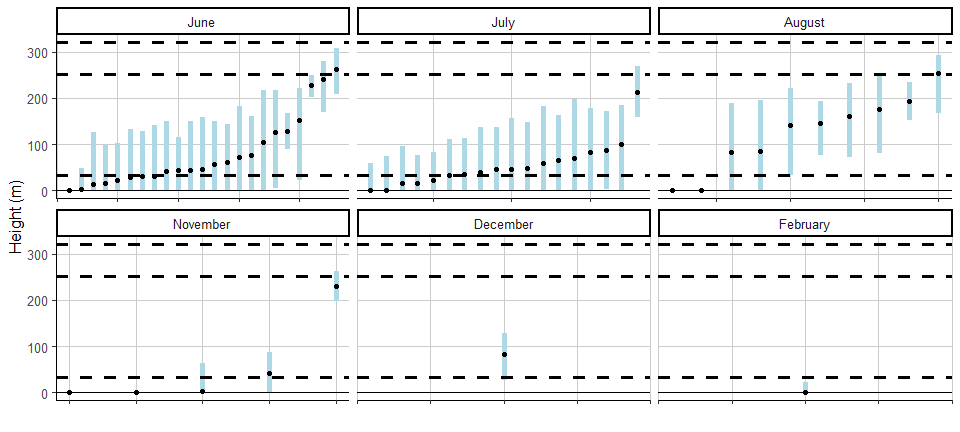


Figure : Ordered height estimates of individual herring gull in the survey area with minimum and maximum potential height range for both smallest and largest turbine specifications in Year 1 at site SG3.

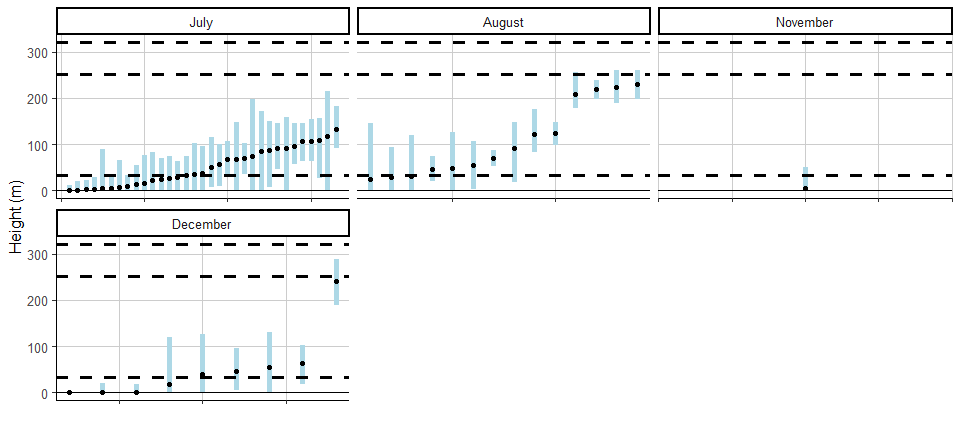


Figure : Ordered height estimates of individual herring gull in the survey area with minimum and maximum potential height range for both smallest and largest turbine specifications in Year 2 at site SG3.

#### Spatial variation in flight height

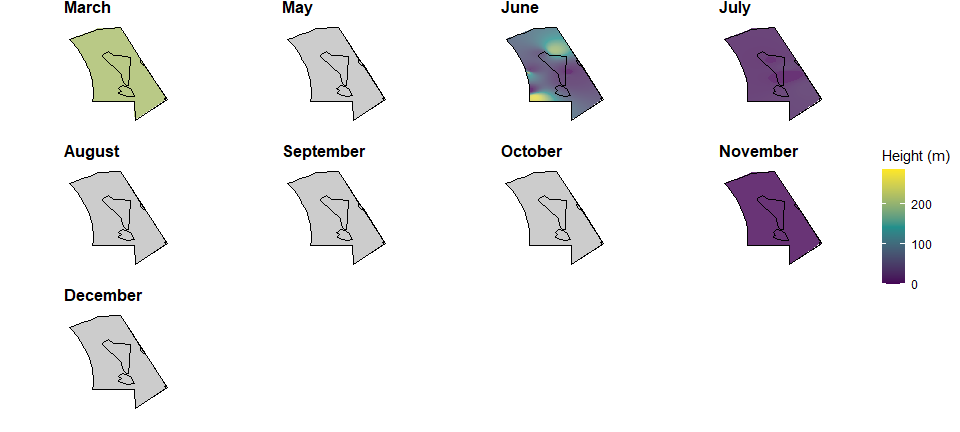


Figure : Two-dimensional spatial variation in estimated mean flight heights of herring gull in Year 1 at site SG2. Flight height estimates were derived using an inverse distance weighted interpolation. Grey plots indicate months were no birds of this species were recorded.

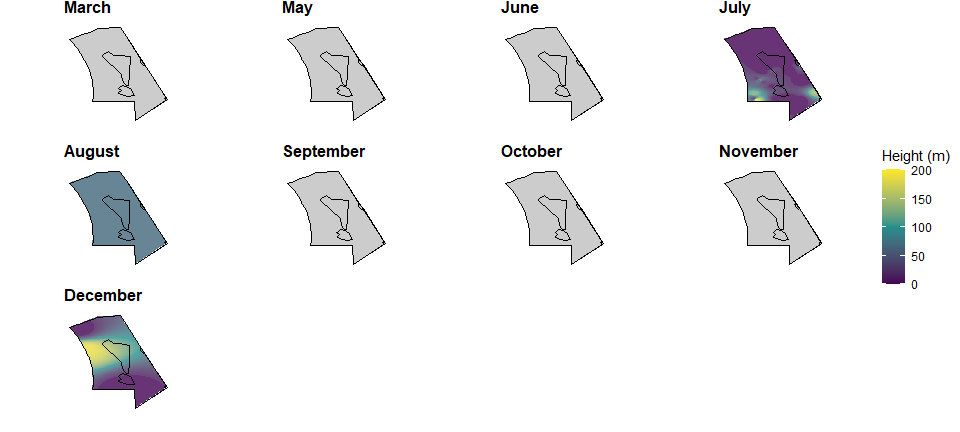


Figure : Two-dimensional spatial variation in estimated mean flight heights of herring gull in Year 2 at site SG2. Flight height estimates were derived using an inverse distance weighted interpolation. Grey plots indicate months were no birds of this species were recorded.

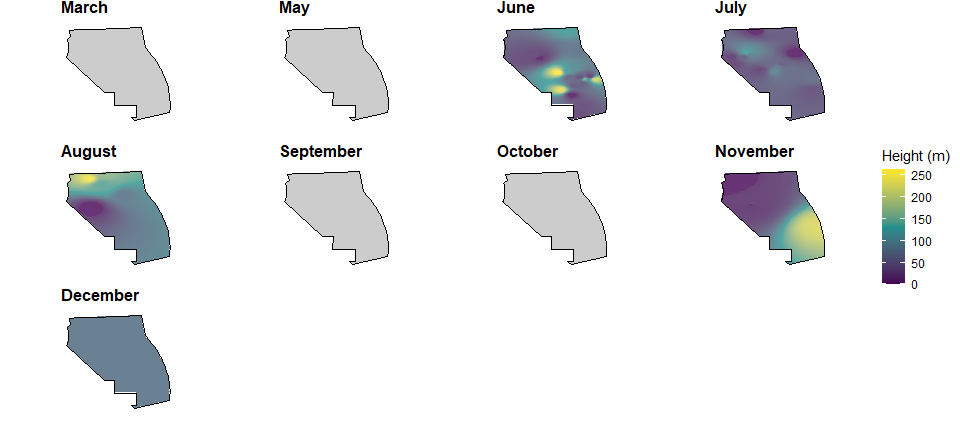


Figure : Two-dimensional spatial variation in estimated mean flight heights of herring gull in Year 1 at site SG3. Flight height estimates were derived using an inverse distance weighted interpolation. Grey plots indicate months were no birds of this species were recorded.



Figure : Two-dimensional spatial variation in estimated mean flight heights of herring gull in Year 2 at site SG3. Flight height estimates were derived using an inverse distance weighted interpolation. Grey plots indicate months were no birds of this species were recorded.

### Fulmar

#### Proportion of birds at PCH

Table : Mean height and proportion (%) of fulmar at PCH in 1at site 1. For flight heights both the mean and the interquartile range (IQR), i.e. the middle 50% of the data, are reported for each of the bootstrapped flight height scenarios.

|  | | | | | | | **Proportion of birds at PCH  (%)** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Year** | **Month** | **Scenario** | **Sample Size  (n)** | **Mean bootstrapped  height estimate  (m)** | **+/- 95% CI** | **Inter-quartile  range** | **Small Scenario  (32 - 252m)** | **Large scenario  (32 - 322m)** |
| Year 1 | March | Low | 5 | 30.5 | (-28.7-89.7) | 0-1 | 20 | 20 |
| Year 1 | Mean | 57.6 | (-16-131.2) | 5.6-62.9 | 40 | 40 |
| Year 1 | High | 101.1 | (26.4-175.8) | 50.9-123.7 | 100 | 100 |
| Year 1 | May | Low | 1 | 0.0 | (NA-NA) | 0-0 | 0 | 0 |
| Year 1 | Mean | 13.3 | (NA-NA) | 13.3-13.3 | 0 | 0 |
| Year 1 | High | 91.6 | (NA-NA) | 91.6-91.6 | 100 | 100 |
| Year 1 | July | Low | 0.0 | (NA-NA) | 0-0 | 0 | 0 |
| Year 1 | Mean | 7.1 | (NA-NA) | 7.1-7.1 | 0 | 0 |
| Year 1 | High | 61.8 | (NA-NA) | 61.8-61.8 | 100 | 100 |
| Year 1 | August | Low | 10.8 | (NA-NA) | 10.8-10.8 | 0 | 0 |
| Year 1 | Mean | 49.8 | (NA-NA) | 49.8-49.8 | 100 | 100 |
| Year 1 | High | 87.3 | (NA-NA) | 87.3-87.3 | 100 | 100 |
| Year 1 | September | Low | 4 | 0.2 | (-0.1-0.5) | 0-0.2 | 0 | 0 |
| Year 1 | Mean | 15.1 | (-1.7-31.9) | 6.7-18.6 | 25 | 25 |
| Year 1 | High | 53.1 | (13.3-92.9) | 36.6-66.3 | 75 | 75 |
| Year 1 | November | Low | 10 | 9.8 | (1.1-18.5) | 0-19.1 | 10 | 10 |
| Year 1 | Mean | 33.5 | (10.7-56.3) | 0-63.7 | 50 | 50 |
| Year 1 | High | 61.5 | (21.4-101.6) | 0-123.5 | 50 | 50 |
| Year 1 | December | Low | 5 | 5.1 | (-4.1-14.3) | 0-1 | 0 | 0 |
| Year 1 | Mean | 41.2 | (15.9-66.5) | 26.8-48.9 | 60 | 60 |
| Year 1 | High | 91.8 | (62.1-121.5) | 81.3-115.4 | 100 | 100 |
| Year 1 | February | Low | 49.3 | (4.5-94.1) | 0.1-91 | 60 | 60 |
| Year 1 | Mean | 88.8 | (36.9-140.7) | 37.2-115.6 | 80 | 80 |
| Year 1 | High | 137.5 | (102.6-172.4) | 110.3-142.1 | 100 | 100 |

Table : Mean height and proportion (%) of fulmar at PCH in 2at site 1. For flight heights both the mean and the interquartile range (IQR), i.e. the middle 50% of the data, are reported for each of the bootstrapped flight height scenarios.

|  | | | | | | | **Proportion of birds at PCH  (%)** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Year** | **Month** | **Scenario** | **Sample Size  (n)** | **Mean bootstrapped  height estimate  (m)** | **+/- 95% CI** | **Inter-quartile  range** | **Small Scenario  (32 - 252m)** | **Large scenario  (32 - 322m)** |
| Year 2 | March | Low | 1 | 0.0 | (NA-NA) | 0-0 | 0.0 | 0 |
| Year 2 | Mean | 39.7 | (NA-NA) | 39.7-39.7 | 100.0 | 100 |
| Year 2 | High | 130.5 | (NA-NA) | 130.5-130.5 | 100.0 | 100 |
| Year 2 | April | Low | 2 | 0.0 | (0-0) | 0-0 | 0.0 | 0 |
| Year 2 | Mean | 17.2 | (1.2-33.2) | 13.1-21.3 | 0.0 | 0 |
| Year 2 | High | 103.3 | (84.3-122.3) | 98.5-108.2 | 100.0 | 100 |
| Year 2 | May | Low | 1 | 0.0 | (NA-NA) | 0-0 | 0.0 | 0 |
| Year 2 | Mean | 0.0 | (NA-NA) | 0-0 | 0.0 | 0 |
| Year 2 | High | 15.3 | (NA-NA) | 15.3-15.3 | 0.0 | 0 |
| Year 2 | June | Low | 0.2 | (NA-NA) | 0.2-0.2 | 0.0 | 0 |
| Year 2 | Mean | 66.2 | (NA-NA) | 66.2-66.2 | 100.0 | 100 |
| Year 2 | High | 118.9 | (NA-NA) | 118.9-118.9 | 100.0 | 100 |
| Year 2 | July | Low | 2 | 0.0 | (0-0) | 0-0 | 0.0 | 0 |
| Year 2 | Mean | 10.3 | (-9.9-30.5) | 5.2-15.5 | 0.0 | 0 |
| Year 2 | High | 49.0 | (-47-145) | 24.5-73.5 | 50.0 | 50 |
| Year 2 | August | Low | 8 | 1.0 | (-0.3-2.3) | 0-0.9 | 0.0 | 0 |
| Year 2 | Mean | 32.6 | (12-53.2) | 18.5-31.7 | 25.0 | 25 |
| Year 2 | High | 82.3 | (49.2-115.4) | 60.1-85.4 | 100.0 | 100 |
| Year 2 | September | Low | 22 | 12.4 | (0.3-24.5) | 0-11.2 | 18.2 | 18 |
| Year 2 | Mean | 42.4 | (20.8-64) | 4.2-70.9 | 36.4 | 36 |
| Year 2 | High | 100.0 | (74.6-125.4) | 60.3-146.3 | 86.4 | 86 |
| Year 2 | October | Low | 8 | 7.6 | (-2.4-17.6) | 0-6.5 | 12.5 | 12 |
| Year 2 | Mean | 20.9 | (1.9-39.9) | 0.8-35.4 | 25.0 | 25 |
| Year 2 | High | 50.0 | (22.8-77.2) | 21.2-76.2 | 62.5 | 62 |
| Year 2 | December | Low | 7 | 49.9 | (-2.1-101.9) | 0.1-83.5 | 42.9 | 43 |
| Year 2 | Mean | 75.0 | (24.1-125.9) | 22-116.5 | 57.1 | 57 |
| Year 2 | High | 114.7 | (74-155.4) | 70.6-148.9 | 100.0 | 100 |
| Year 2 | February | Low | 1 | 0.0 | (NA-NA) | 0-0 | 0.0 | 0 |
| Year 2 | Mean | 2.3 | (NA-NA) | 2.3-2.3 | 0.0 | 0 |
| Year 2 | High | 60.2 | (NA-NA) | 60.2-60.2 | 100.0 | 100 |

Table : Mean height and proportion (%) of fulmar at PCH in 1at site 2. For flight heights both the mean and the interquartile range (IQR), i.e. the middle 50% of the data, are reported for each of the bootstrapped flight height scenarios.

|  | | | | | | | **Proportion of birds at PCH  (%)** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Year** | **Month** | **Scenario** | **Sample Size  (n)** | **Mean bootstrapped  height estimate  (m)** | **+/- 95% CI** | **Inter-quartile  range** | **Small Scenario  (32 - 252m)** | **Large scenario  (32 - 322m)** |
| Year 1 | March | Low | 7 | 0.3 | (-0.3-0.9) | 0-0 | 0.0 | 0 |
| Year 1 | Mean | 10.3 | (-3.6-24.2) | 0-10.8 | 14.3 | 14 |
| Year 1 | High | 37.5 | (9.1-65.9) | 9.3-61.1 | 42.9 | 43 |
| Year 1 | May | Low | 1 | 0.0 | (NA-NA) | 0-0 | 0.0 | 0 |
| Year 1 | Mean | 1.2 | (NA-NA) | 1.2-1.2 | 0.0 | 0 |
| Year 1 | High | 33.5 | (NA-NA) | 33.5-33.5 | 100.0 | 100 |
| Year 1 | July | Low | 2 | 0.0 | (0-0) | 0-0 | 0.0 | 0 |
| Year 1 | Mean | 5.5 | (3.4-7.6) | 4.9-6 | 0.0 | 0 |
| Year 1 | High | 62.7 | (44.3-81.1) | 58-67.4 | 100.0 | 100 |
| Year 1 | August | Low | 3 | 0.0 | (0-0) | 0-0 | 0.0 | 0 |
| Year 1 | Mean | 14.7 | (-4.1-33.5) | 5.7-22 | 33.3 | 33 |
| Year 1 | High | 74.2 | (1-147.4) | 51.8-111.3 | 66.7 | 67 |
| Year 1 | September | Low | 2 | 130.3 | (52.7-207.9) | 110.5-150.1 | 100.0 | 100 |
| Year 1 | Mean | 164.2 | (104.5-223.9) | 149-179.4 | 100.0 | 100 |
| Year 1 | High | 196.5 | (152.1-240.9) | 185.2-207.8 | 100.0 | 100 |
| Year 1 | October | Low | 1 | 20.1 | (NA-NA) | 20.1-20.1 | 0.0 | 0 |
| Year 1 | Mean | 79.7 | (NA-NA) | 79.7-79.7 | 100.0 | 100 |
| Year 1 | High | 143.9 | (NA-NA) | 143.9-143.9 | 100.0 | 100 |
| Year 1 | November | Low | 8 | 0.0 | (-0.1-0.1) | 0-0 | 0.0 | 0 |
| Year 1 | Mean | 5.5 | (-1.2-12.2) | 0-6.2 | 0.0 | 0 |
| Year 1 | High | 24.9 | (2.1-47.7) | 0-37.3 | 25.0 | 25 |
| Year 1 | December | Low | 3 | 36.7 | (5.1-68.3) | 21.4-48.7 | 33.3 | 33 |
| Year 1 | Mean | 72.0 | (36-108) | 58.6-89.5 | 100.0 | 100 |
| Year 1 | High | 102.9 | (60.1-145.7) | 91.9-124.7 | 100.0 | 100 |
| Year 1 | February | Low | 7 | 30.3 | (-4.2-64.8) | 0-49.3 | 28.6 | 29 |
| Year 1 | Mean | 51.5 | (5.2-97.8) | 4.3-82.6 | 42.9 | 43 |
| Year 1 | High | 89.2 | (37.2-141.2) | 33.5-129.2 | 71.4 | 71 |

Table : Mean height and proportion (%) of fulmar at PCH in 2at site 2. For flight heights both the mean and the interquartile range (IQR), i.e. the middle 50% of the data, are reported for each of the bootstrapped flight height scenarios.

|  | | | | | | | **Proportion of birds at PCH  (%)** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Year** | **Month** | **Scenario** | **Sample Size  (n)** | **Mean bootstrapped  height estimate  (m)** | **+/- 95% CI** | **Inter-quartile  range** | **Small Scenario  (32 - 252m)** | **Large scenario  (32 - 322m)** |
| Year 2 | March | Low | 3 | 0.1 | (0-0.2) | 0.1-0.1 | 0.0 | 0 |
| Year 2 | Mean | 42.2 | (25-59.4) | 33.8-48.7 | 66.7 | 67 |
| Year 2 | High | 99.9 | (63.6-136.2) | 83-114.9 | 100.0 | 100 |
| Year 2 | April | Low | 4 | 21.4 | (-20.6-63.4) | 0-21.4 | 25.0 | 25 |
| Year 2 | Mean | 43.4 | (-23.3-110.1) | 8.5-48.8 | 25.0 | 25 |
| Year 2 | High | 96.0 | (24-168) | 65.3-118.6 | 75.0 | 75 |
| Year 2 | May | Low | 3 | 16.7 | (-15.9-49.3) | 0-25 | 33.3 | 33 |
| Year 2 | Mean | 36.6 | (-21.7-94.9) | 7.1-54.7 | 33.3 | 33 |
| Year 2 | High | 82.4 | (15.7-149.1) | 53.7-112.6 | 66.7 | 67 |
| Year 2 | June | Low | 1 | 0.4 | (NA-NA) | 0.4-0.4 | 0.0 | 0 |
| Year 2 | Mean | 57.7 | (NA-NA) | 57.7-57.7 | 100.0 | 100 |
| Year 2 | High | 117.3 | (NA-NA) | 117.3-117.3 | 100.0 | 100 |
| Year 2 | July | Low | 2 | 1.6 | (-1.3-4.5) | 0.8-2.3 | 0.0 | 0 |
| Year 2 | Mean | 25.7 | (12.5-38.9) | 22.3-29 | 50.0 | 50 |
| Year 2 | High | 62.8 | (47.6-78) | 58.9-66.7 | 100.0 | 100 |
| Year 2 | August | Low | 5 | 0.0 | (-0.1-0.1) | 0-0.1 | 0.0 | 0 |
| Year 2 | Mean | 23.4 | (7.2-39.6) | 9.5-27.2 | 20.0 | 20 |
| Year 2 | High | 75.3 | (29.4-121.2) | 46-68.8 | 100.0 | 100 |
| Year 2 | September | Low | 13 | 18.5 | (-4.7-41.7) | 0-0 | 23.1 | 23 |
| Year 2 | Mean | 49.1 | (13.2-85) | 1-72.8 | 46.2 | 46 |
| Year 2 | High | 102.7 | (60-145.4) | 30.3-160.2 | 69.2 | 69 |
| Year 2 | October | Low | 3 | 0.2 | (-0.1-0.5) | 0-0.3 | 0.0 | 0 |
| Year 2 | Mean | 7.7 | (-6.6-22) | 0.4-11.6 | 0.0 | 0 |
| Year 2 | High | 31.4 | (-0.6-63.4) | 16.1-44 | 33.3 | 33 |
| Year 2 | December | Low | 10 | 9.6 | (-6.2-25.4) | 0-0.2 | 10.0 | 10 |
| Year 2 | Mean | 29.5 | (9.9-49.1) | 11.2-30.5 | 20.0 | 20 |
| Year 2 | High | 83.3 | (60.3-106.3) | 59.9-108.7 | 100.0 | 100 |
| Year 2 | January | Low | 6 | 10.3 | (-4.2-24.8) | 0-12.9 | 16.7 | 17 |
| Year 2 | Mean | 33.1 | (4.6-61.6) | 8-54.4 | 33.3 | 33 |
| Year 2 | High | 82.3 | (43.4-121.2) | 48.4-125.9 | 83.3 | 83 |
| Year 2 | February | Low | 3 | 0.0 | (0-0) | 0-0 | 0.0 | 0 |
| Year 2 | Mean | 15.9 | (-6.3-38.1) | 4.6-22.3 | 33.3 | 33 |
| Year 2 | High | 71.4 | (28.6-114.2) | 50.3-86.9 | 100.0 | 100 |

#### Flight height ranges

For interpretation of the following graphs, see Section 3.2.

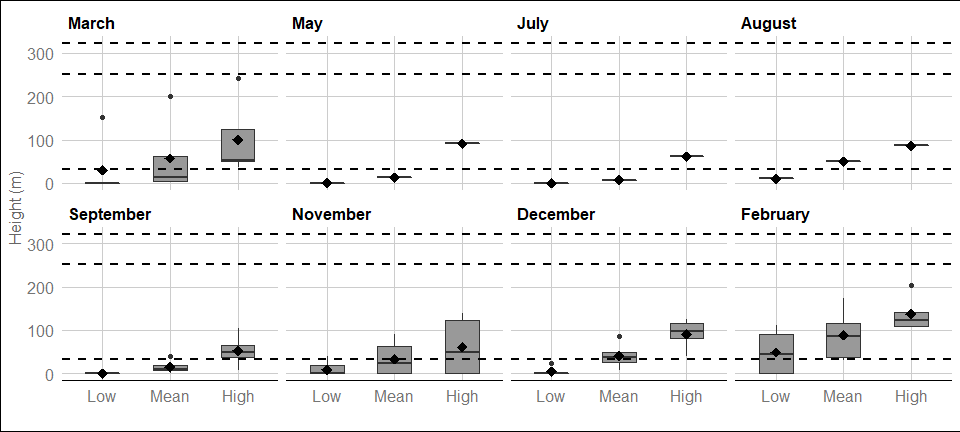


Figure : Distribution of fulmar flight heights from minimum (2.5th percentile), mean and maximum (97.5th percentile) bootstrapped estimates in Year 1 at site SG2. The mean of the population for each distribution is indicated by the black dot, and the middle line represents the median. The grey boxes represent the middle 50% of the data. The dotted lines indicate the minimum and maximum rotor heights of both wind turbine scenarios.

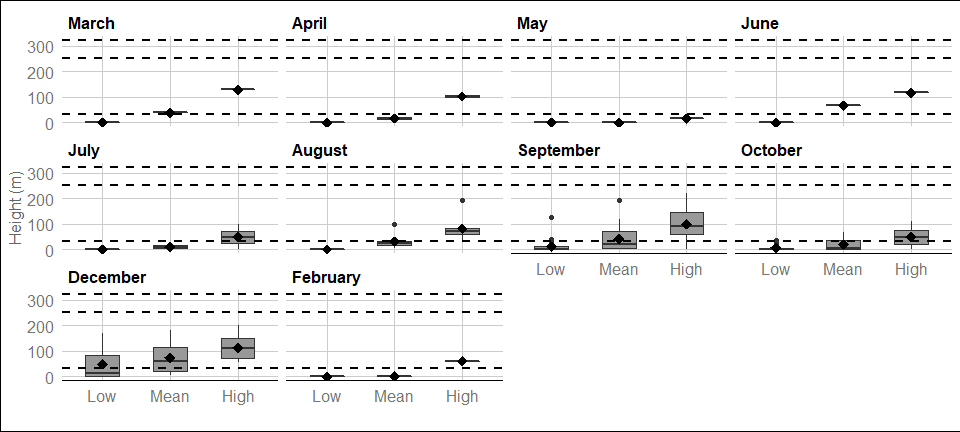


Figure : Distribution of fulmar flight heights from minimum (2.5th percentile), mean and maximum (97.5th percentile) bootstrapped estimates in Year 2 at site SG2. The mean of the population for each distribution is indicated by the black dot, and the middle line represents the median. The grey boxes represent the middle 50% of the data. The dotted lines indicate the minimum and maximum rotor heights of both wind turbine scenarios.

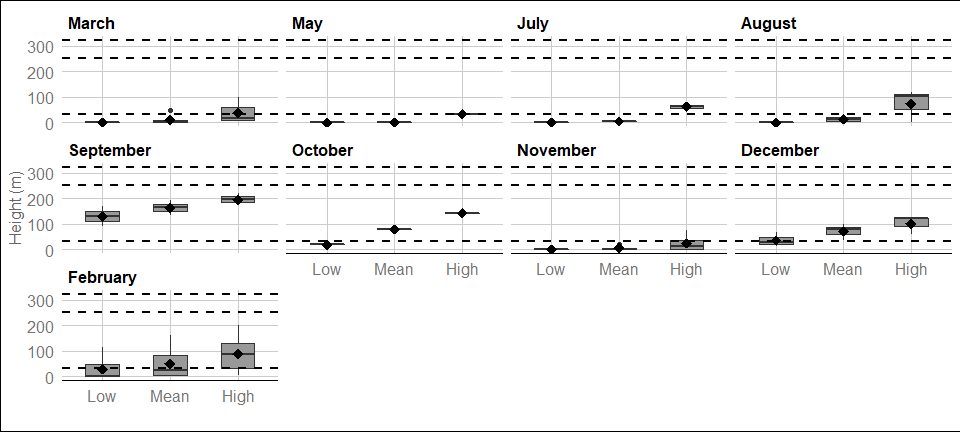


Figure : Distribution of fulmar flight heights from minimum (2.5th percentile), mean and maximum (97.5th percentile) bootstrapped estimates in Year 1 at site SG3. The mean of the population for each distribution is indicated by the black dot, and the middle line represents the median. The grey boxes represent the middle 50% of the data. The dotted lines indicate the minimum and maximum rotor heights of both wind turbine scenarios.

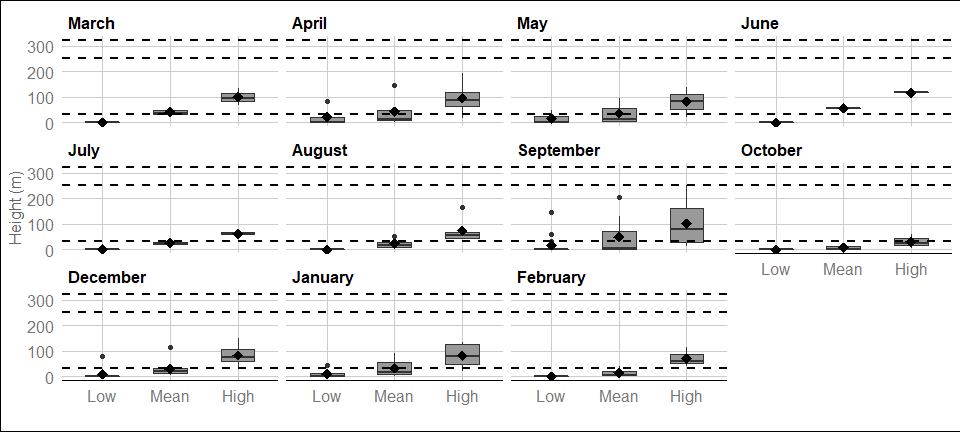


Figure : Distribution of fulmar flight heights from minimum (2.5th percentile), mean and maximum (97.5th percentile) bootstrapped estimates in Year 2 at site SG3. The mean of the population for each distribution is indicated by the black dot, and the middle line represents the median. The grey boxes represent the middle 50% of the data. The dotted lines indicate the minimum and maximum rotor heights of both wind turbine scenarios.

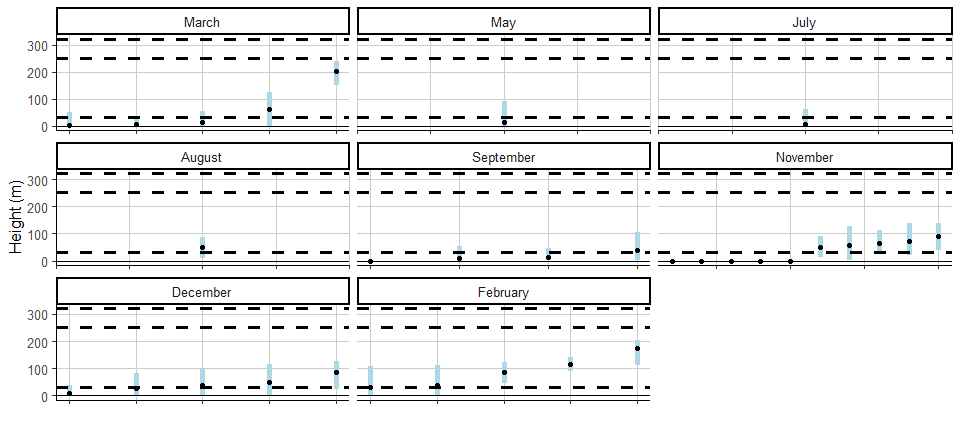


Figure : Ordered height estimates of individual fulmar in the survey area with minimum and maximum potential height range for both smallest and largest turbine specifications in Year 1 at site SG2.

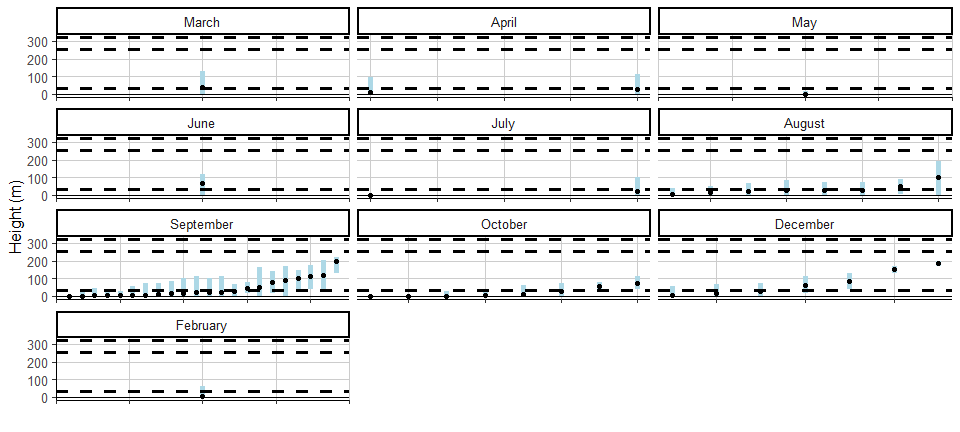


Figure : Ordered height estimates of individual fulmar in the survey area with minimum and maximum potential height range for both smallest and largest turbine specifications in Year 2 at site SG2.

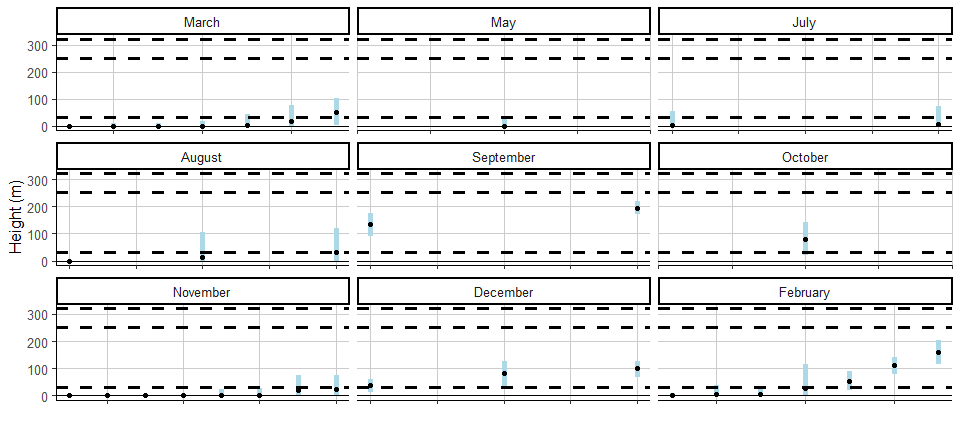


Figure : Ordered height estimates of individual fulmar in the survey area with minimum and maximum potential height range for both smallest and largest turbine specifications in Year 1 at site SG3.

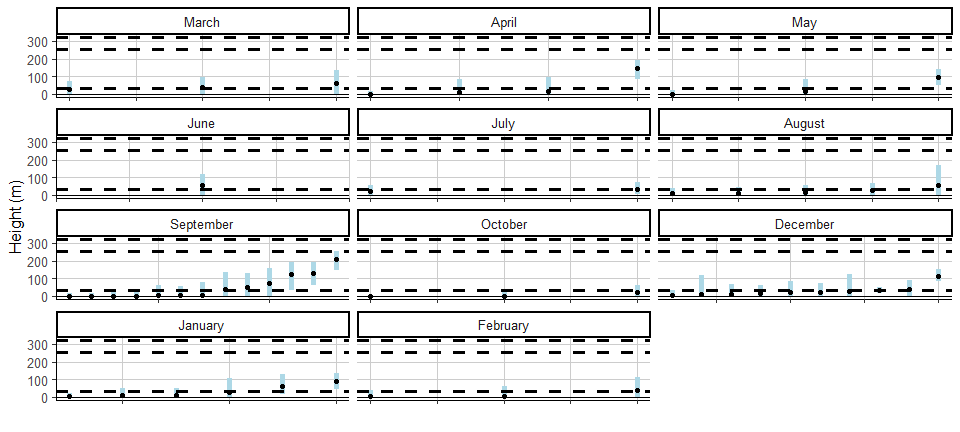


Figure : Ordered height estimates of individual fulmar in the survey area with minimum and maximum potential height range for both smallest and largest turbine specifications in Year 2 at site SG3.

#### Spatial variation in flight height

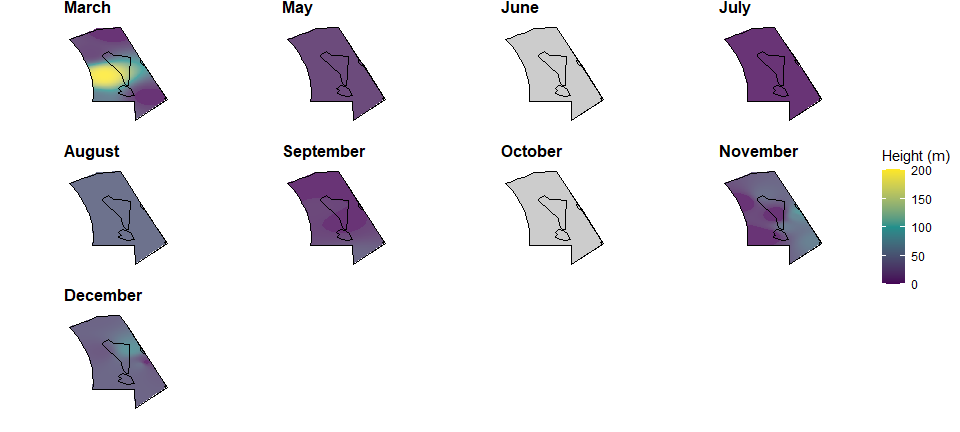


Figure : Two-dimensional spatial variation in estimated mean flight heights of fulmar in Year 1 at site SG2. Flight height estimates were derived using an inverse distance weighted interpolation. Grey plots indicate months were no birds of this species were recorded.

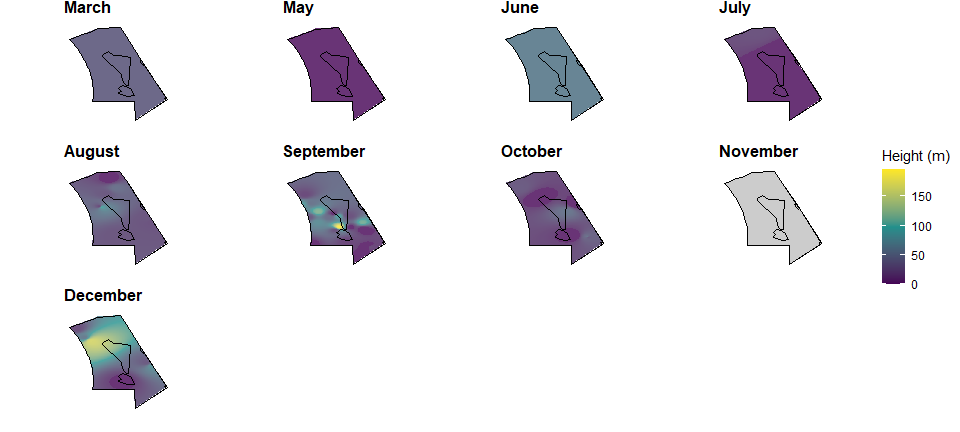


Figure : Two-dimensional spatial variation in estimated mean flight heights of fulmar in Year 2 at site SG2. Flight height estimates were derived using an inverse distance weighted interpolation. Grey plots indicate months were no birds of this species were recorded.

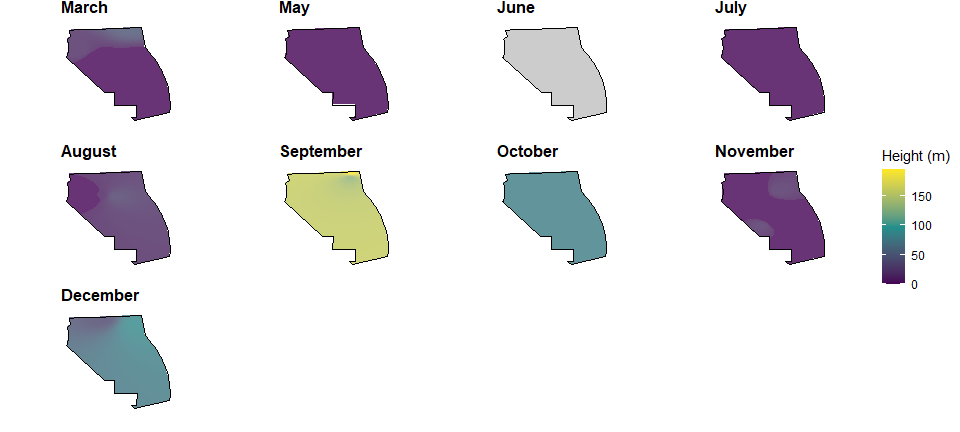


Figure : Two-dimensional spatial variation in estimated mean flight heights of fulmar in Year 1 at site SG3. Flight height estimates were derived using an inverse distance weighted interpolation. Grey plots indicate months were no birds of this species were recorded.

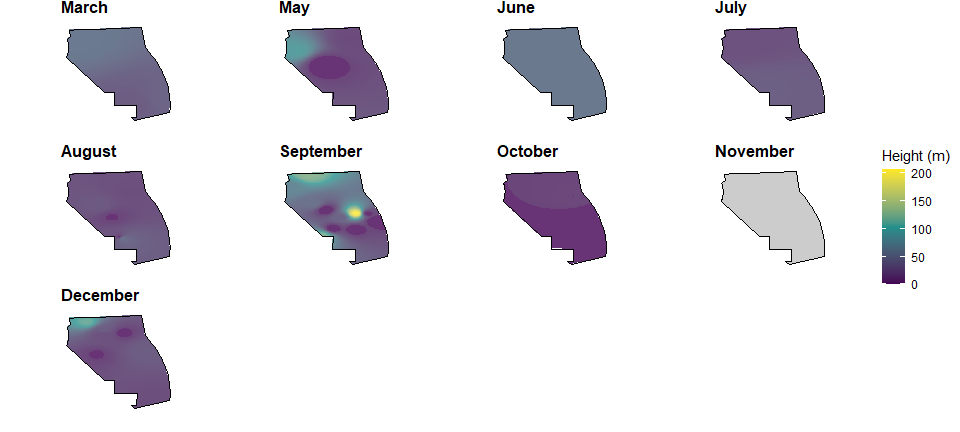


Figure : Two-dimensional spatial variation in estimated mean flight heights of fulmar in Year 2 at site SG3. Flight height estimates were derived using an inverse distance weighted interpolation. Grey plots indicate months were no birds of this species were recorded.