Table S1. List of 16 candidate logistic regression models predicting if genetic differentiation is significantly detectable based on combinations of landscape variables, at each level of relative resistance. The five levels of relative resistance are R16 (non-habitat 16 times as resistant as habitat), R8 (non-habitat 8 times as resistant as habitat), R4 (non-habitat 4 times as resistant as habitat), R2 (non-habitat 2 times as resistant as habitat), and R1.5 (non-habitat 1.5 times as resistant as habitat . AIC is the Akaike Information Criterion value for each model, delta AIC is the difference in AIC value between each model and the model with the lowest AIC value, and wi is the AIC model weight for each model. COHESION – Patch Cohesion of habitat; GYRATE\_AM – Correlation Length of habitat; PD – Patch density of habitat; AI – habitat Aggregation Index; CLUMPY – Clumpy index of habitat aggregation.

|  |  |  |  |
| --- | --- | --- | --- |
| Model | AIC | Delta AIC | wi |
| R16 |  |  |  |
| COHESION\_CLUMPY\_PD | 1244.44 | 0 | 1 |
| GYRATE\_AM\_CLUMPY\_AI | 1253.349 | 8.909 | 4.51 x10−20 |
| GYRATE\_CLUMPY\_PD | 1254.976 | 10.536 | 1.32 x10−23 |
| PD\_GYRATE | 1273.751 | 29.311 | 2.25 x10−64 |
| AI\_GYRATE\_AM | 1276.22 | 31.78 | 9.79 x10−70 |
| AI\_CLUMPY | 1287.059 | 42.619 | 2.84 x10−93 |
| COHESION\_PD | 1292.257 | 47.817 | 1.5 x10−104 |
| COHESION\_CLUMPY | 1299.194 | 54.754 | 1.3 x10−119 |
| COHESION | 1300.994 | 56.554 | 1.6 x10−123 |
| CLUMPY\_GYRATE | 1304.773 | 60.333 | 9.7 x10−132 |
| GYRATE\_AM | 1306.6 | 62.16 | 1.1 x10−135 |
| AI | 1440.924 | 196.484 | 0 |
| CLUMPY\_PD | 1455.818 | 211.378 | 0 |
| PD | 1547.553 | 303.113 | 0 |
| CLUMPY | 1683.932 | 439.492 | 0 |
| R8 |  |  |  |
| AI\_GYRATE\_AM | 1315.329 | 0 | 0.9646 |
| GYRATE\_AM\_CLUMPY\_AI | 1315.99 | 0.661 | 0.0354 |
| PD\_GYRATE | 1318.683 | 3.354 | 5.03E-08 |
| GYRATE\_CLUMPY\_PD | 1320.608 | 5.279 | 3.32E-12 |
| CLUMPY\_GYRATE | 1327.624 | 12.295 | 1.93E-27 |
| GYRATE\_AM | 1334.457 | 19.128 | 2.81E-42 |
| COHESION\_CLUMPY\_PD | 1335.971 | 20.642 | 1.45E-45 |
| COHESION\_PD | 1342.469 | 27.14 | 1.12E-59 |
| COHESION | 1343.513 | 28.184 | 6.08E-62 |
| COHESION\_CLUMPY | 1344.863 | 29.534 | 7.11E-65 |
| AI\_CLUMPY | 1398.11 | 82.781 | 1.7E-180 |
| AI | 1482.171 | 166.842 | 0 |
| CLUMPY\_PD | 1557.413 | 242.084 | 0 |
| PD | 1590.605 | 275.276 | 0 |
| CLUMPY | 1688.915 | 373.586 | 0 |
| R4 |  |  |  |
| GYRATE\_CLUMPY\_PD | 1467.178 | 0 | 1 |
| GYRATE\_AM\_CLUMPY\_AI | 1472.444 | 5.266 | 3.67305E-12 |
| COHESION\_CLUMPY\_PD | 1480.217 | 13.039 | 4.8548E-29 |
| PD\_GYRATE | 1483.074 | 15.896 | 3.03581E-35 |
| AI\_GYRATE\_AM | 1485.267 | 18.089 | 5.25092E-40 |
| GYRATE\_AM | 1485.396 | 18.218 | 2.75496E-40 |
| CLUMPY\_GYRATE | 1486.531 | 19.353 | 9.45136E-43 |
| AI\_CLUMPY | 1492.392 | 25.214 | 1.77213E-55 |
| COHESION\_CLUMPY | 1507.071 | 39.893 | 2.36293E-87 |
| COHESION | 1520.479 | 53.301 | 1.8128E-116 |
| COHESION\_PD | 1521.86 | 54.682 | 1.8178E-119 |
| CLUMPY\_PD | 1554.31 | 87.132 | 6.2412E-190 |
| AI | 1568.453 | 101.275 | 1.2138E-220 |
| PD | 1606.503 | 139.325 | 2.8814E-303 |
| CLUMPY | 1654.011 | 186.833 | 0 |
| R2 |  |  |  |
| GYRATE\_AM\_CLUMPY\_AI | 1328.096 | 0 | 0.669295 |
| COHESION\_CLUMPY\_PD | 1328.237 | 0.141 | 0.330705 |
| AI\_GYRATE\_AM | 1332.979 | 4.883 | 1.67E-11 |
| COHESION\_CLUMPY | 1334.712 | 6.616 | 2.88E-15 |
| COHESION | 1336.369 | 8.273 | 7.26E-19 |
| COHESION\_PD | 1338.011 | 9.915 | 1.97E-22 |
| PD\_GYRATE | 1338.423 | 10.327 | 2.52E-23 |
| GYRATE\_CLUMPY\_PD | 1339.453 | 11.357 | 1.46E-25 |
| CLUMPY\_GYRATE | 1344.708 | 16.612 | 5.66E-37 |
| GYRATE\_AM | 1346.2 | 18.104 | 3.26E-40 |
| AI\_CLUMPY | 1351.554 | 23.458 | 7.71E-52 |
| AI | 1409.581 | 81.485 | 7.6E-178 |
| CLUMPY\_PD | 1466.238 | 138.142 | 7.1E-301 |
| PD | 1484.519 | 156.423 | 0 |
| CLUMPY | 1545.356 | 217.26 | 0 |
| R1.5 |  |  |  |
| CLUMPY | 1105.992 | 0 | 0.454682 |
| COHESION | 1106.127 | 0.135 | 0.231504 |
| GYRATE\_AM | 1106.169 | 0.177 | 0.187654 |
| PD | 1106.347 | 0.355 | 0.077061 |
| AI | 1106.439 | 0.447 | 0.048647 |
| CLUMPY\_GYRATE | 1107.616 | 1.624 | 0.000135 |
| AI\_GYRATE\_AM | 1107.622 | 1.63 | 0.000131 |
| PD\_GYRATE | 1107.743 | 1.751 | 7.17E-05 |
| COHESION\_CLUMPY | 1107.836 | 1.844 | 4.5E-05 |
| AI\_CLUMPY | 1107.89 | 1.898 | 3.44E-05 |
| CLUMPY\_PD | 1107.967 | 1.975 | 2.34E-05 |
| COHESION\_PD | 1108.125 | 2.133 | 1.06E-05 |
| GYRRATE\_AM\_CLUMPY\_AI | 1109.554 | 3.562 | 8.37E-09 |
| GYRATE\_CLUMPY\_PD | 1109.591 | 3.599 | 6.96E-09 |
| COHESION\_CLUMPY\_PD | 1109.672 | 3.68 | 4.64E-09 |

Table S2. Bootstrap model validation. Dxy -Somers’ Dxy rank correlation between predicted probabilities and observed responses. R2 - Generalized R2N index of Nagelkerke. Intercept and slope of an overall logistic calibration equation. Emax - maximum absolute difference in predicted and calibrated probabilities. D - discrimination index (model LR (chi-square - 1)/n). U - unreliability index; the difference in -2 log likelihood between un-calibrated X beta and X beta with overall intercept and slope calibrated to test sample / n. Q - overall quality index (logarithmic probability score) Q = D - U. B - Brier or quadratic probability score. Optimism - training sample statistic - test sample statistic, providing an estimate of over-optimism due to over-fitting.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Optimism 1.5 | Optimism 2 | Optimism 4 | Optimism 8 | Optimism 16 |
| Dxy | 0.02687 | 0.00238 | -0.00104 | 0.00306 | -0.00058 |
| R2 | 0.00139 | 0.004398 | 0.001836 | 0.00510 | 0.001015 |
| Intercept | 1.775769 | -0.00544 | -0.00263 | 0.00622 | -0.00376 |
| Slope | 1.150827 | 0.010466 | 0.001618 | 0.00642 | -0.00531 |
| Emax | 1 | 0.003224 | 0.000841 | 0.00250 | 0.001797 |
| D | 0.000821 | 0.003632 | 0.001614 | 0.00558 | 0.001563 |
| U | -0.0017 | -0.00182 | -0.00158 | -0.00180 | -0.00195 |
| Q | 0.002521 | 0.00545 | 0.003196 | 0.00738 | 0.003516 |
| B | -0.00023 | -0.0018 | -0.00108 | -0.00111 | -0.00044 |