**Table 3** Final models analysing pike behavioural traits in both lakes

The variables analysed were the extent of horizontal area use (dH-KUD) and vertical movement (dV-KS), horizontal and vertical activity, and mean daily depth. All variables were modelled accounting for residual correlations using an ARMA autocorrelation structure of order (p=1, q=1). **Fixed-effects:** β standardized estimates are shown (mean-centred and scaled by 2 s.d.), the response remains untransformed. In parenthesis, 95% confidence intervals. **Random effects:** *σ2e,* residual (within-individual) error variance; *τ00 tag\_id,* random intercept variance (i.e., variation between individual intercepts and average intercept); *τ11 tag\_id.time,* random slope variance (i.e., variation in individual temporal slopes across days)*; ρ01 tag\_id,* random slope-intercept correlation (i.e., correlation between the individual random intercepts and slopes); *R*, repeatability measuring the proportion of variance at the individual level; *R* *SHC,* *R* LSC, repeatability computed for each lake dataset separately (see main text for more details). Significance values of random-effects parameters were computed using likelihood ratio tests between each two nested models varying only in their random-effects structure (only *p*-value of the χ2 test is shown). **ARMA(1,1):** *ρ AR(1)*,parameter Φ of the autoregressive correlation term AR(1); *ρ MA(1)* parameter Θ of the moving average correlation term MA(1) **Metrics of the model:** *AICc*, corrected Akaike information criterion for small sample size; *R2m*, marginal-R2 refers to the proportion of variation explained by fixed effects; *R2c*, conditional R-squared indicates the proportion of the variance explained by fixed and random effects; *pseudo-R2*, McFadden adjusted pseudo R-squared(*sensu* Nakagawa et al. 2017); *logLik*, Log-likelihood estimation of the model computed by restricted maximum likelihood. Significance values for the regression estimates: \*p<0.1; \*\*p<0.05; \*\*\*p<0.01

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | | | | | | | | |
|  | | **dH-KUD**  *log(m2)* | **dV-KS**  *log(m)* | **Horizontal activity**  *sqrt(m/s-1)* | **Vertical activity**  *sqrt(m/s-1)* | **Depth**  *log(m)* | |
| (Intercept) | | 0.772\*\*\* | 5.324\*\*\* | 26.477\*\*\* | 29.254\*\*\* | 5.599\*\*\* | |
|  | | (0.625, 0.920) | (5.063, 5.585) | (22.848, 30.106) | (26.590, 31.918) | (5.258, 5.940) | |
| time × pL [LSC] | | -0.003\* | -0.002 | -0.055\* | -0.044 | -0.002 | |
|  | | (-0.005, 0.00002) | (-0.007, 0.003) | (-0.115, 0.005) | (-0.099, 0.011) | (-0.007, 0.003) | |
| time | | 0.002\* | -0.002 | -0.001 | -0.004 | 0.002 | |
|  | | (-0.0003, 0.004) | (-0.005, 0.002) | (-0.044, 0.042) | (-0.043, 0.035) | (-0.001, 0.006) | |
| pL [LSC] | | 0.390\*\*\* | 0.315 | 9.620\*\*\* | 3.993\*\* | 0.129 | |
|  | | (0.183, 0.598) | (-0.053, 0.684) | (4.460, 14.779) | (0.220, 7.766) | (-0.350, 0.608) | |
| pBL × pL [LSC] | | 0.235\*\*\* |  |  |  |  | |
|  | | (0.106, 0.365) |  |  |  |  | |
| pBL | | 0.135\*\*\* |  | 1.632 |  |  | |
|  | | (0.062, 0.208) |  | (-0.233, 3.497) |  |  | |
| pWT × pBL | | 0.020\* |  | 0.607\* |  |  | |
|  | | (-0.002, 0.042) |  | (-0.025, 1.239) |  |  | |
| pWT | | -0.027\*\* |  |  |  | 0.104\*\*\* | |
|  | | (-0.048, -0.005) |  |  |  | (0.026, 0.183) | |
| **Random Effects** | |  |  |  |  |  | |
|  | |  |  |  |  |  | |
| σ2e | | 0.077‡ | 0.702‡ | 65.981‡ | 97.340‡ | 0.936‡ | |
|  | | (0.070, 0.085) | (0.650, 0.760) | (60.202, 72.315) | (89.810, 105.497) | (0.835, 1.049) | |
| τ00 tag\_id | | 0.059\*\*\* | 0.146\*\*\* | 32.075\*\*\* | 12.120 | 0.213\*\* | |
|  | | (0.028, 0.122) | (0.055, 0.385) | (14.597, 70.481) | (3.324, 44.186) | (0.048, 0.950) | |
| τ11 time | | 1.02-05\*\*\* | 2.72-05\*\*\* | 0.004\*\*\* | 0.003\*\* | 1.35-05 | |
|  | | (4.97-06, 2.08-05) | (1.1-05, 6.8-05) | (0.002, 0.010) | (0.001, 0.008) | (1.38-06, 0.10-04) | |
| ρ01 tag\_id.time | | -0.822\*\*\* | -0.749\*\*\* | -0.67\*\*\* | -0.728 | -0.293 | |
|  | | (-0.931, -0.580) | (-0.918, -0.347) | (-0.874, -0.265) | (-0.922, -0.242) | (-0.831, 0.542) | |
| *R* | | 0.431 | 0.172 | 0.327 | 0.111 | 0.185 | |
| *RLSC* | | 0.493† | 1.25-05 | 0.230 | 0.07† | 0.151 | |
| *R*HSC | | 0.311† | 0.305 | 0.350 | 0.259† | 0.175 | |
|  | |  |  |  |  |  | |
| **ARMA(1,1)** | |  |  |  |  |  | |
| ρ AR(1) | | 0.719\*\*\* | 0.610\*\*\* | 0.691\*\*\* | 0.892\*\*\* | 0.764\*\*\* | |
|  | | (0.652, 0.774) | (0.463, 0.724) | (0.616, 0.755) | (0.645, 0.970) | (0.690, 0.822) | |
| ρ MA(1) | | -0.261\*\*\* | -0.270\*\*\* | -0.230\*\*\* | -0.793\*\*\* | -0.277\*\*\* | |
|  | | (-0.340, -0.179) | (-0.419, -0.106) | (-0.324, -0.133) | (-0.910, -0.560) | (-0.375, -0.172) | |
|  | |  |  |  |  |  | |
| R2m / R2c | | 0.43/0.60ξ | 0.02/0.15 | 0.17/0.39 | 0.01/0.12 | | 0.01/0.21 | |
| pseudo-R2 | | 0.59 | 0.002 | 0.003 | 0.0005 | | 0.002 | |
| logLik | | -18.09 | -2309.49 | -6595.08 | -7202.22 | | -2346.14 | |
| AICc | | 64.4 | 4639.09 | 13216.36 | 14424.55 | | 4714.42 | |

† Repeatability was estimated from the model fitted with only an autoregressive AR1 term and excluding the moving average process due to lack of model convergence using *nlme*

‡ No *p*-value was computed

ξ Model with the largest R2 index was the best in terms of goodness of fit to the data.