Avifaunal feeding guilds’ response to landscape compositional heterogeneity and their drivers in forest mosaic, Uttarakhand, India

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**Section 1: Spatial autocorrelation**

Table S1.1: Moran’s I value of the response variables

|  |  |  |  |
| --- | --- | --- | --- |
| **Response variable** | **Moran I** | **z value** | **P value** |
| Overall bird richness | -0.017 | -0.52 | 0.59 |
| Insectivore richness | -0.12 | -1.13 | 0.26 |
| Carnivore richness | 0.06 | 1.21 | 0.23 |
| Frugivore richness | 0.01 | 0.54 | 0.59 |
| Granivore richness | 0.02 | 0.66 | 0.51 |
| Frugi+insectivore richness | -0.07 | -0.46 | 0.65 |
| Nectarivore richness | 0.07 | 1.33 | 0.18 |
| Omnivore richness | -0.03 | 0.02 | 0.99 |
| Piscivore richness | -0.08 | -0.66 | 0.51 |

z value <- 2.58 - -1.65 (dispersed), -1.65- 1.65 (Random), 1.65 - >2.58 (clustered)

**Section 2: Screening of landscape predictors**

Table S2.1: Value of coefficient of determination (R2) of landscape variables explaining the richness of species at various scales. Bold value represent the scale of best prediction. \*\*\*Significant landscape predictors (P<0.05).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Landscape variables** | **0.5 km** | **0.75 km** | **1 km** | **1.25 km** | **1.5 km** | **1.75 km** |
| **Overall species richness** | | | | | | |
| ED\*\*\* | **0.2646** | 0.2544 | 0.1968 | 0.1683 | 0.1267 | 0.08994 |
| SHDI\*\*\* | 0.3878 | **0.4199** | 0.3257 | 0.2937 | 0.2492 | 0.1595 |
| HH/AG | 0.01573 | 0.02489 | 0.02501 | 0.01662 | 0.008995 | 2.20E-07 |
| TK\*\*\* | **0.2287** | 0.211 | 0.1344 | 0.05516 | 0.01354 | 0.002229 |
| WB | 0.00456 | 0.01145 | 0.02052 | 0.03573 | 0.04644 | 0.04697 |
| BR | 0.00799 | 0.01128 | 0.02234 | 0.06231 | 0.0637 | 0.04779 |
| DRF | 0.0929 | 0.04154 | 0.02954 | 0.0238 | 0.01857 | 0.01499 |
| MF\*\*\* | **0.2669** | 0.1569 | 0.07663 | 0.04897 | 0.03346 | 0.01938 |
| MRF | 0.06659 | 0.07329 | 0.05456 | 0.05384 | 0.05745 | 0.03898 |
| PL | 1.39E-05 | 0.001258 | 0.004647 | 0.004795 | 0.00132 | 0.000125 |
| SF | 0.00114 | 0.01144 | 0.0174 | 0.01828 | 0.01274 | 0.005354 |
| SMF\*\*\* | **0.1641** | 0.1248 | 0.1081 | 0.07769 | 0.04759 | 0.04547 |
| SC | 0.00233 | 0.01286 | 0.01236 | 0.01454 | 0.01018 | 0.004375 |
| **Carnivore** | | | | | | |
| ED | 0.104976 | 0.069696 | 0.030625 | 0.017689 | 0.011025 | 0.002601 |
| SHDI\*\*\* | 0.111556 | 0.135424 | 0.136161 | 0.1225 | **0.142884** | 0.112225 |
| HH/AG | 0.000784 | 0.0025 | 0.0016 | 0.0004 | 0.000004 | 0.000009 |
| TP | 0.072361 | 0.103684 | 0.110224 | 0.066049 | 0.027556 | 0.020164 |
| WB\*\*\* | 0.0225 | 0.049284 | 0.126025 | 0.207025 | 0.221841 | **0.223729** |
| BR\*\*\* | 0.128164 | 0.179776 | 0.184041 | **0.221841** | 0.204304 | 0.161604 |
| DRF | 0.020449 | 0.049284 | 0.0625 | 0.063504 | 0.077841 | 0.087025 |
| MF | 0.044521 | 0.015876 | 0.000144 | 0.003025 | 0.010609 | 0.016129 |
| MRF | 0.020736 | 0.0361 | 0.053824 | 0.060025 | 0.068644 | 0.024025 |
| PL | 0.056644 | 0.020449 | 0.003844 | 0.002116 | 0.005329 | 0.011236 |
| SF | 0.032041 | 0.066564 | 0.0729 | 0.0729 | 0.073441 | 0.0729 |
| SMF | 0.000004 | 0.000196 | 0.001764 | 0.000064 | 0.000784 | 0.000324 |
| SC | 0.004761 | 0.027556 | 0.026244 | 0.027889 | 0.032041 | 0.005929 |
| **Granivore** | | | | | | |
| ED\*\*\* | **0.322624** | 0.304704 | 0.309136 | 0.279841 | 0.221841 | 0.161604 |
| SHDI\*\*\* | 0.439569 | 0.541696 | **0.558009** | 0.528529 | 0.505521 | 0.419904 |
| HH/AG\*\*\* | 0.156025 | 0.1849 | **0.194481** | 0.149769 | 0.104976 | 0.099856 |
| TK\*\*\* | 0.138384 | **0.135424** | 0.121801 | 0.0289 | 0.019881 | 0.002401 |
| WB | 0.015129 | 0.025281 | 0.054289 | 0.077284 | 0.086436 | 0.085264 |
| BR\*\*\* | 0.021025 | 0.099225 | 0.2116 | **0.314721** | 0.305809 | 0.254016 |
| DRF | 0.000025 | 0.006561 | 0.009025 | 0.01 | 0.010201 | 0.011449 |
| MF\*\*\* | 0.096721 | **0.147456** | 0.0784 | 0.046656 | 0.028561 | 0.014161 |
| MRF | 0.003136 | 0.000961 | 0.0001 | 0.001024 | 0.002025 | 0.0144 |
| PL | 0.005476 | 0.009409 | 0.006561 | 0.004489 | 0.009604 | 0.015876 |
| SF | 0.110889 | 0.081225 | 0.064009 | 0.050176 | 0.048841 | 0.064516 |
| SMF | 0.066049 | 0.040401 | 0.032761 | 0.030625 | 0.021609 | 0.021316 |
| SC\*\*\* | 0.070225 | 0.098596 | 0.112896 | **0.130321** | 0.125316 | 0.168921 |
| **Insectivore** | | | | | | |
| ED\*\*\* | 0.147456 | **0.148996** | 0.096721 | 0.084681 | 0.062001 | 0.045796 |
| SHDI\*\*\* | 0.229441 | **0.267289** | 0.192721 | 0.1764 | 0.134689 | 0.069169 |
| HH/AG | 0.0004 | 0.002304 | 0.007225 | 0.008649 | 0.007921 | 0.000289 |
| TK\*\*\* | **0.258064** | 0.252004 | 0.16 | 0.085264 | 0.015376 | 0.001225 |
| WB | 0.012544 | 0.017424 | 0.025281 | 0.030976 | 0.035344 | 0.035721 |
| BR | 0.000784 | 0.000169 | 0.000025 | 0.005329 | 0.008281 | 0.0049 |
| DRF\*\*\* | **0.143641** | 0.090601 | 0.076729 | 0.068121 | 0.059049 | 0.0529 |
| MF\*\*\* | **0.237169** | 0.09 | 0.037636 | 0.021025 | 0.013924 | 0.007056 |
| MRF | 0.093025 | 0.091809 | 0.078961 | 0.083521 | 0.086436 | 0.064516 |
| PL | 0.000121 | 0.003844 | 0.001936 | 0.000529 | 0.000064 | 0.000049 |
| SF | 0.0036 | 0.026896 | 0.044521 | 0.049729 | 0.037249 | 0.023409 |
| SMF\*\*\* | **0.190096** | 0.1521 | 0.130321 | 0.080089 | 0.043681 | 0.047089 |
| SC | 0.046656 | 0.000361 | 0 | 0.000225 | 0.000225 | 0.002916 |
| **Frugi+Insectivore** | | | | | | |
| ED\*\*\* | **0.407044** | 0.388129 | 0.401956 | 0.375769 | 0.3136 | 0.229441 |
| SHDI\*\*\* | **0.459684** | 0.444889 | 0.413449 | 0.3844 | 0.262144 | 0.142129 |
| HH/AG\*\*\* | **0.162409** | 0.1444 | 0.135424 | 0.086436 | 0.047961 | 0.007921 |
| TP | 0.082369 | 0.051529 | 0.012544 | 0.002601 | 0.030976 | 0.052441 |
| WB | 0.010404 | 0.009216 | 0.017689 | 0.033856 | 0.042025 | 0.043264 |
| BR | 0.000841 | 0.0016 | 0.000784 | 0.015376 | 0.006241 | 0.0009 |
| DRF\*\*\* | **0.170569** | 0.119716 | 0.086436 | 0.071824 | 0.055225 | 0.051076 |
| MF\*\*\* | **0.285156** | 0.113569 | 0.053361 | 0.023409 | 0.006561 | 0.000004 |
| MRF | 0.018225 | 0.018225 | 0.011664 | 0.007396 | 0.0064 | 0.003969 |
| PL | 0.007056 | 0.008649 | 0.030276 | 0.031329 | 0.037636 | 0.034596 |
| SF | 0.004356 | 0.009409 | 0.028561 | 0.034969 | 0.022801 | 0.020164 |
| SMF\*\*\* | 0.192721 | 0.209764 | **0.218089** | 0.1849 | 0.142884 | 0.133956 |
| SC | 0.0025 | 0.030625 | 0.044521 | 0.059049 | 0.026569 | 0.013225 |
| **Nectarivore** | | | | | | |
| ED\*\*\* | 0.163216 | 0.165649 | 0.209764 | **0.217156** | 0.208849 | 0.173056 |
| SHDI\*\*\* | **0.290521** | 0.251001 | 0.219024 | 0.222784 | 0.187489 | 0.139129 |
| HH/AG\*\*\* | **0.179776** | 0.170569 | 0.110889 | 0.0729 | 0.049284 | 0.031329 |
| TK | 0.026244 | 0.007569 | 0.000009 | 0.004225 | 0.023409 | 0.038025 |
| WB | 0.027225 | 0.027889 | 0.024649 | 0.027225 | 0.036864 | 0.036864 |
| BR | 0.001681 | 0.042025 | 0.017424 | 0.002116 | 0.001681 | 0.002916 |
| DRF | 0.033856 | 0.0441 | 0.053824 | 0.055696 | 0.058081 | 0.059049 |
| MF | 0.054756 | 0.027889 | 0.026896 | 0.034596 | 0.025281 | 0.009025 |
| MRF | 0.018225 | 0.005776 | 0.001764 | 0.001089 | 0.000961 | 0.002209 |
| PL | 0.009025 | 0.0001 | 0.001521 | 0.003481 | 0.000784 | 0.000196 |
| SF | 0.026569 | 0.060516 | 0.070225 | 0.081225 | 0.099856 | 0.112896 |
| SMF | 0.002304 | 0.003364 | 0.006724 | 0.005929 | 0.000576 | 0.002116 |
| SC\*\*\* | 0.116281 | 0.1521 | **0.154449** | 0.148225 | 0.127449 | 0.110889 |
| **Omnivore** | | | | | | |
| ED | 0.069169 | 0.031684 | 0.031329 | 0.017689 | 0.012321 | 0.008836 |
| SHDI\*\*\* | **0.239121** | 0.190096 | 0.184041 | 0.156025 | 0.190969 | 0.146689 |
| HH/AG\*\*\* | 0.217156 | **0.266256** | 0.25 | 0.215296 | 0.173056 | 0.150544 |
| TK | 0.007396 | 0.01 | 0.008464 | 0.004225 | 0.006084 | 0.000256 |
| WB\*\*\* | 0.020449 | 0.045796 | 0.076176 | 0.126025 | 0.138384 | **0.139129** |
| BR\*\*\* | 0.004489 | 0.027889 | 0.073441 | 0.1024 | 0.124609 | **0.127449** |
| DRF | 0.001089 | 0.0004 | 0.000004 | 0 | 0.000729 | 0.001521 |
| MF | 0.032041 | 0.003844 | 0.0004 | 0.006241 | 0.016129 | 0.025281 |
| MRF | 0.006724 | 0.010201 | 0.011881 | 0.015625 | 0.017956 | 0.059049 |
| PL | 0.055225 | 0.0784 | 0.029929 | 0.016384 | 0.022201 | 0.031329 |
| SF | 0.052441 | 0.072361 | 0.059049 | 0.043681 | 0.055225 | 0.0625 |
| SMF | 0.003969 | 0.000064 | 0.000256 | 0.001156 | 0.001089 | 0.000121 |
| SC\*\*\* | 0.104976 | 0.117649 | 0.107584 | 0.110224 | 0.171396 | **0.175561** |
| **Piscivore** | | | | | | |
| ED | 0.087025 | 0.084681 | 0.067081 | 0.046656 | 0.038416 | 0.037249 |
| SHDI | 0.0784 | 0.065536 | 0.033489 | 0.024025 | 0.015376 | 0.003721 |
| HH/AG | 0.037636 | 0.04 | 0.030625 | 0.033124 | 0.044944 | 0.075076 |
| TK | 0.022201 | 0.032041 | 0.0256 | 0.0256 | 0.027225 | 0.028561 |
| WB\*\*\* | 0.109561 | **0.120409** | 0.059049 | 0.051984 | 0.044944 | 0.042436 |
| BR | 0.0784 | 0.080089 | 0.053824 | 0.043264 | 0.0289 | 0.024964 |
| DRF | 0.021609 | 0.003721 | 0.000144 | 0.000036 | 0.001681 | 0.001936 |
| MF | 0.108241 | 0.068644 | 0.035344 | 0.016641 | 0.008464 | 0.006889 |
| MRF | 0.097969 | 0.098596 | 0.051076 | 0.051076 | 0.059536 | 0.051984 |
| PL | 0.000576 | 0.006241 | 0.000196 | 0 | 0.0004 | 0.000729 |
| SF | 0 | 0.001024 | 0.0036 | 0.001681 | 0.000064 | 0 |
| SMF | 0.0676 | 0.083521 | 0.073441 | 0.057121 | 0.042025 | 0.049729 |
| SC | 0.024336 | 0.0324 | 0.0324 | 0.026244 | 0.026244 | 0.044944 |
| **Frugivore** | | | | | | |
| ED | 0.049284 | 0.030976 | 0.006561 | 0.000784 | 0.001156 | 0.008649 |
| SHDI | 0.004624 | 0.01 | 0.002304 | 0.000256 | 0.001681 | 0.0081 |
| HH/AG | 0.000625 | 0.000004 | 0.000441 | 0.002116 | 0.001089 | 0.008836 |
| TK | 0.029584 | 0.039204 | 0.0225 | 0.003721 | 0.0004 | 0.003721 |
| WB\*\*\* | 0.177241 | 0.188356 | **0.209764** | 0.173889 | 0.167281 | 0.170569 |
| BR | 0.005041 | 0.005776 | 0.000961 | 0.000121 | 0.003249 | 0.006561 |
| DRF | 0.069169 | 0.020736 | 0.003969 | 0.000729 | 0.000144 | 0.000529 |
| MF | 0.070225 | 0.043681 | 0.010404 | 0.004356 | 0.003481 | 0.001764 |
| MRF | 0.014161 | 0.005329 | 0.0000 | 0.003249 | 0.006561 | 0.033856 |
| PL | 0.004761 | 0.000324 | 0.043264 | 0.055225 | 0.055696 | 0.069696 |
| SF | 0.011025 | 0.0144 | 0.011881 | 0.008281 | 0.002704 | 0.003481 |
| SMF | 0.0169 | 0.006889 | 0.001296 | 0.000484 | 0.007744 | 0.0196 |
| SC | 0.004225 | 0.000009 | 0.001225 | 0.002601 | 0.001936 | 0.000324 |

ED=Edge Density, SHDI=Shannon diversity, HH/AG= Human habitation with agriculture, BR= Barren land, DR= Dry Riverine, MF= Mixed forest, PL=Plantation, MRF= Moist riverine forest, SF=Sal forest, SMF= Sal mixed forest, SC=Scrubland, TP=Teak plantation, WB=Water body

**Section 3: Multi-collinearity among explanatory variables**

**Table 3.1 Correlation value between various landscape predictors of overall species richness**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | ED | SHDI | TK | MF | SMF |
| ED | 1 |  |  |  |  |
| SHDI | .796\*\* | 1 |  |  |  |
| TK | 0.265 | .441\* | 1 |  |  |
| MF | .623\*\* | .614\*\* | .461\* | 1 |  |
| SMF | .404\* | .408\* | -0.103 | 0.22 | 1 |

Table 3.2 Correlation value between various landscape predictors variable of carnivore species richness

|  |  |  |  |
| --- | --- | --- | --- |
|  | BR | WB | SHDI |
| BR | 1 |  |  |
| WB | .562\*\* | 1 |  |
| SHDI | .537\*\* | .712\*\* | 1 |

Table 3.3 Correlation between various landscape predictors variable of granivore species richness

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | ED | SHDI | HH/AG | TK | BR | MF |
| ED |  |  |  |  |  |  |
| SHDI | .614\*\* |  |  |  |  |  |
| HH/AG | 0.135 | .520\*\* |  |  |  |  |
| TK | -0.093 | .410\* | -0.108 |  |  |  |
| BR | 0.123 | .413\* | 0.114 | 0.135 |  |  |
| MF | .579\*\* | .557\*\* | -0.136 | 0.361 | 0.296 |  |
| SC | 0.185 | 0.31 | .555\*\* | -0.205 | 0.237 | -0.241 |

Table 3.4 Correlation value between various landscape predictors variable of insectivore species richness

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Landscape variables | ED | SHDI | TK | DRF | MF |
| ED |  |  |  |  |  |
| SHDI | .824\*\* |  |  |  |  |
| TK | 0.175 | .441\* |  |  |  |
| DRF | 0.068 | -0.12 | -0.129 |  |  |
| MF | .563\*\* | .614\*\* | .461\* | -0.1 |  |
| SMF | .497\*\* | .408\* | -0.103 | -0.296 | 0.22 |

Table 3.5 Correlation value between various landscape predictors variable of Frugi+insectivore species richness

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Landscape variables | ED | SHDI | HH/AG | DRF | MF |
| ED |  |  |  |  |  |
| SHDI | .804\*\* |  |  |  |  |
| HH/AG | 0.234 | 0.329 |  |  |  |
| DRF | 0.076 | -0.138 | -0.268 |  |  |
| MF | .623\*\* | .696\*\* | -0.169 | -0.1 |  |
| SMF | .404\* | .390\* | 0.08 | -0.296 | 0.22 |

Table 3.6 Correlation value between various landscape predictors variable of nectarivore species richness

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | ED | SHDI | SIEI | HH/AG |
| ED |  |  |  |  |
| SHDI | .672\*\* |  |  |  |
| SIEI | .684\*\* | .957\*\* |  |  |
| HH/AG | 0.284 | 0.329 | .383\* |  |
| SC | 0.304 | 0.226 | 0.192 | .492\*\* |

Table 3.7 Correlation value between various landscape predictors variable of omnivore species richness

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | SHDI | HH/AG | WB | BR |
| SHDI |  |  |  |  |
| HH/AG | 0.359 |  |  |  |
| WB | .371\* | 0.286 |  |  |
| BR | 0.127 | 0.09 | .571\*\* |  |
| SC | 0.126 | .594\*\* | 0.16 | 0.236 |

ED=Edge Density, SHDI=Shannon diversity, HH/AG= Human habitation with agriculture, BR= Barren land, DR= Dry Riverine, MF= Mixed forest, PL=Plantation, MRF= Moist riverine forest, SF=Sal forest, SMF= Sal mixed forest, SC=Scrubland, TP=Teak plantation, WB=Water body.

\*\*\*Significant correlation between landscape predictors (P<0.05),

**Section 4: Birds in the study area**

**Table S4.1: Birds and their feeding guild recorded at various sampling sites in Ramnagar FD, Uttarakhand**

|  |  |  |  |
| --- | --- | --- | --- |
| **Order** | **Families** | **Row Labels** | **Feeding Guild** |
| Accipitriformes | Accipitridae | Short-toed Snake-eagle | carnivore |
| Accipitriformes | Accipitridae | Tawny Eagle | carnivore |
| Accipitriformes | Accipitridae | Black-winged Kite | carnivore |
| Accipitriformes | Accipitridae | Steppe Eagle | carnivore |
| Accipitriformes | Accipitridae | Lesser Fish Eagle | carnivore |
| Accipitriformes | Accipitridae | Mountain Hawk-eagle | carnivore |
| Accipitriformes | Accipitridae | Oriental Honey-buzzard | carnivore |
| Accipitriformes | Accipitridae | Pariah Kite | carnivore |
| Accipitriformes | Accipitridae | Indian Spotted eagle | carnivore |
| Accipitriformes | Accipitridae | Eurasian Sparrowhawk | carnivore |
| Accipitriformes | Accipitridae | Shikra | carnivore |
| Accipitriformes | Accipitridae | Crested Serpent-eagle | carnivore |
| Accipitriformes | Accipitridae | Changeable Hawk-eagle | carnivore |
| Passeriformes | Aegithinidae | Common Iora | Insectivore |
| Coraciiformes | Alcedinidae | Stork-billed Kingfisher | piscivore |
| Coraciiformes | Alcedinidae | Common Kingfisher | piscivore |
| Coraciiformes | Alcedinidae | Crested Kingfisher | piscivore |
| Coraciiformes | Alcedinidae | Pied kingfisher | piscivore |
| Coraciiformes | Alcedinidae | White-throated Kingfisher | piscivore |
| Pelecaniformes | Ardeidae | Cattle Egret | carnivore |
| Pelecaniformes | Ardeidae | Indian Pond heron | carnivore |
| Pelecaniformes | Ardeidae | Little Egret | carnivore |
| Bucerotiformes | Bucerotidae | Great Hornbill | frugivore |
| Bucerotiformes | Bucerotidae | Pied Hornbill | frugivore |
| Bucerotiformes | Bucerotidae | Indian Grey Hornbill | frugivore |
| Charadriiformes | Burhinidae | Indian Thick-Knee | granivore |
| Passeriformes | Campephagidae | Black-winged Cuckooshrike | Insectivore |
| Passeriformes | Campephagidae | Rosy Minivet | Insectivore |
| Passeriformes | Campephagidae | Long-tailed Minivet | Insectivore |
| Passeriformes | Campephagidae | Small Minivet | Insectivore |
| Passeriformes | Campephagidae | Bar-winged Flycatcher-shrike | Insectivore |
| Passeriformes | Campephagidae | Scarlet Minivet | Insectivore |
| Caprimulgiformes | Caprimulgidae | Indian Nightjar | Insectivore |
| Passeriformes | Certhiidae | Bar-tailed Treecreeper | Insectivore |
| Charadriiformes | Charadriidae | River Lapwing | insectivore |
| Charadriiformes | Charadriidae | Little ringed Plover | Insectivore |
| Charadriiformes | Charadriidae | Red-wattled Lapwing | Insectivore |
| Passeriformes | Chloropseidae | Orange-bellied Leafbird | omnivore |
| Passeriformes | Cisticolidae | Zitting Cisticola | Insectivore |
| Passeriformes | Cisticolidae | Striated Prinia | Insectivore |
| Passeriformes | Cisticolidae | Ashy Prinia | Insectivore |
| Passeriformes | Cisticolidae | Indian Tailorbird | Insectivore |
| Passeriformes | Cisticolidae | Grey-breasted Prinia | Insectivore |
| Passeriformes | Cisticolidae | Jungle Prinia | Insectivore |
| Passeriformes | Cittidae | Grey-bellied Tesia | Insectivore |
| Passeriformes | Cittidae | Chestnut-crowned Bush Warbler | Insectivore |
| Passeriformes | Cittidae | Abberant Bush Warbler | Insectivore |
| Columbiformes | Columbidae | Wedge-tailed Green Pigeon | frugivore |
| Columbiformes | Columbidae | Laughing Dove | granivore |
| Columbiformes | Columbidae | Emerald Dove | granivore |
| Columbiformes | Columbidae | Yellow-footed Green Pigeon | frugivore |
| Columbiformes | Columbidae | Oriental Turtle Dove | granivore |
| Columbiformes | Columbidae | Collared Dove | granivore |
| Columbiformes | Columbidae | Rock Pigeon | granivore |
| Columbiformes | Columbidae | Spotted Dove | granivore |
| Coraciiformes | Coraciidae | Indian Roller | Insectivore |
| Passeriformes | Corvidae | Black-headed Jay | omnivore |
| Passeriformes | Corvidae | Common Green Magpie | carnivore |
| Passeriformes | Corvidae | Red-billed Blue Magpie | omnivore |
| Passeriformes | Corvidae | Roufus Treepie | omnivore |
| Passeriformes | Corvidae | Grey Treepie | omnivore |
| Passeriformes | Corvidae | Jungle Crow | omnivore |
| Cuculiformes | Cuculidae | Grey-bellied Cuckoo | Insectivore |
| Cuculiformes | Cuculidae | Eurasian Cuckoo | Insectivore |
| Cuculiformes | Cuculidae | Green-billed Malkoha | omnivore |
| Cuculiformes | Cuculidae | Indian Cuckoo | Insectivore |
| Cuculiformes | Cuculidae | Dollar Bird | Insectivore |
| Cuculiformes | Cuculidae | Common Hawk Cuckoo | Insectivore |
| Cuculiformes | Cuculidae | Asian Koel | omnivore |
| Cuculiformes | Cuculidae | Greater Coucal | omnivore |
| Passeriformes | Dicaeidae | Pale-billed Flowerpecker | frugivore |
| Passeriformes | Dicaeidae | Thick-billed Flowerpecker | frugivore |
| Passeriformes | Dicuridae | Bronze Drongo | Insectivore |
| Passeriformes | Dicuridae | Ashy Drongo | Insectivore |
| Passeriformes | Dicuridae | Lesser Racquet-tailed Drongo | Insectivore |
| Passeriformes | Dicuridae | White-bellied Drongo | Insectivore |
| Passeriformes | Dicuridae | Crow-billed Drongo | Insectivore |
| Passeriformes | Dicuridae | Spangled Drongo | Insectivore |
| Passeriformes | Dicuridae | Greater Racquet-tailed Drongo | Insectivore |
| Passeriformes | Dicuridae | Black Drongo | Insectivore |
| Passeriformes | Emberizidae | chestnut-eared bunting | granivore |
| Passeriformes | Emberizidae | Crested bunting | Insectivore |
| Passeriformes | Emberizidae | White-capped Bunting | Insectivore |
| Passeriformes | Estrildidae | White-rumped Munia | Insectivore |
| Passeriformes | Estrildidae | Scaly-breasted Munia | granivore |
| Passeriformes | Fringillidae | Yellow-brested Greenfinch | Insectivore |
| Passeriformes | Fringillidae | Common Rosefinch | Herbivore |
| Caprimulgiformes | Hemiprocnidae | Crested Treeswift | Insectivore |
| Passeriformes | Hirundinidae | Wire-tailed swallow | Insectivore |
| Passeriformes | Hirundinidae | Barn Swallow | Insectivore |
| Passeriformes | Hirundinidae | Red-rumped Swallow | Insectivore |
| Passeriformes | Hirundinidae | Plain Martin | Insectivore |
| Passeriformes | Laniidae | Long-tailed Shrike | Insectivore |
| Piciformes | Megalaimidae | Great Barbet | frugivore |
| Piciformes | Megalaimidae | Blue-throated Barbet | frugivore |
| Piciformes | Megalaimidae | Copper-smith Barbet | frugivore |
| Piciformes | Megalaimidae | Lineated Barbet | frugivore |
| Passeriformes | Meropidae | Blue-bearded bee-eater | Insectivore |
| Passeriformes | Meropidae | Chestnut-headed Bee-eater | Insectivore |
| Passeriformes | Meropidae | Green Bee-eater | Insectivore |
| Passeriformes | Monarchidae | Black-naped Monarch | Insectivore |
| Passeriformes | Monarchidae | Paradise Flycatcher | Insectivore |
| Passeriformes | Motacillidae | Tawny Pipit | Insectivore |
| Passeriformes | Motacillidae | Yellow Wagtail | Insectivore |
| Passeriformes | Motacillidae | Long-billed Pipit | Insectivore |
| Passeriformes | Motacillidae | Olive-backed Pipit | Insectivore |
| Passeriformes | Motacillidae | Paddyfield Pipit | Insectivore |
| Passeriformes | Motacillidae | White Wagtail | Insectivore |
| Passeriformes | Motacillidae | White-browed Wagtail | Insectivore |
| Passeriformes | Motacillidae | Grey wagtail | Insectivore |
| Passeriformes | Muscicapidae | Blue-capped Rock Thrush | Insectivore |
| Passeriformes | Muscicapidae | Rufous-bellied Niltava | Insectivore |
| Passeriformes | Muscicapidae | Tickell's Blue flycatcher | Insectivore |
| Passeriformes | Muscicapidae | Rufous-gorgeted Flycatcher | Insectivore |
| Passeriformes | Muscicapidae | Spotted forktail | Insectivore |
| Passeriformes | Muscicapidae | Rock Chat | Insectivore |
| Passeriformes | Muscicapidae | Small Niltava | Insectivore |
| Passeriformes | Muscicapidae | Common Stonechat | Insectivore |
| Passeriformes | Muscicapidae | Ultramarine Flycatcher | Insectivore |
| Passeriformes | Muscicapidae | Black Redstart | Insectivore |
| Passeriformes | Muscicapidae | White-rumped Shama | Insectivore |
| Passeriformes | Muscicapidae | Plumbeous Redstart | Insectivore |
| Passeriformes | Muscicapidae | Slaty blue Flycatcher | Insectivore |
| Passeriformes | Muscicapidae | Blue-throated Blue Flycatcher | Insectivore |
| Passeriformes | Muscicapidae | Golden-fronted Leafbird | omnivore |
| Passeriformes | Muscicapidae | White-capped Water Redstart | Insectivore |
| Passeriformes | Muscicapidae | Little Pied flycatcher | Insectivore |
| Passeriformes | Muscicapidae | Pied Bushchat | Insectivore |
| Passeriformes | Muscicapidae | Virditer Flycatcher | Insectivore |
| Passeriformes | Muscicapidae | Asian Brown Flycatcher | Insectivore |
| Passeriformes | Muscicapidae | Indian Robin | Insectivore |
| Passeriformes | Muscicapidae | Grey Bushchat | Insectivore |
| Passeriformes | Muscicapidae | Oriental Magpie Robin | Insectivore |
| Passeriformes | Nectariniidae | Fire-tailed Sunbird | Nectivore |
| Passeriformes | Nectariniidae | Crimson Sunbird | Nectivore |
| Passeriformes | Nectariniidae | Purple Sunbird | Nectivore |
| Passeriformes | Nectarniidae | Green-tailed Sunbird | Nectivore |
| Passeriformes | Oriolidae | Golden Oriole | omnivore |
| Passeriformes | Oriolidae | Maroon Oriole | Insectivore |
| Passeriformes | Oriolidae | Black-hooded Oriole | Insectivore |
| Passeriformes | Paridae | Black-lored Tit | Insectivore |
| Passeriformes | paridae | Great Tit | Insectivore |
| Passeriformes | Passeridae | House Sparrow | omnivore |
| Passeriformes | Passeridae | Chesnut-shouldered Petronia | granivore |
| Passeriformes | Pellorneidae | Puff-throated Babbler | Insectivore |
| Galliformes | Phasianidae | Jungle Bush Quail | granivore |
| Galliformes | Phasianidae | Black Francolin | granivore |
| Galliformes | Phasianidae | Grey Francolin | granivore |
| Galliformes | Phasianidae | Kalij Pheasant | granivore |
| Galliformes | Phasianidae | Indian Peafowl | omnivore |
| Galliformes | Phasianidae | Red Junglefowl | granivore |
| Passeriformes | Phylloscopidae | Grey-sided Bush Warbler | Insectivore |
| Passeriformes | Phylloscopidae | Tickle's Leaf Warbler | Insectivore |
| Passeriformes | Phylloscopidae | Lemon-rumped Warbler | Insectivore |
| Passeriformes | Phylloscopidae | Blyth's Leaf warbler | Insectivore |
| Passeriformes | Phylloscopidae | Whistler's Warbler | Insectivore |
| Passeriformes | Phylloscopidae | Dusky Warbler | Insectivore |
| Passeriformes | Phylloscopidae | Sulphur-bellied Warbler | Insectivore |
| Passeriformes | Phylloscopidae | Greenish Warbler | Insectivore |
| Passeriformes | Phylloscopidae | Grey-hooded Warbler | Insectivore |
| Passeriformes | Phylloscopidae | Hume's Leaf Warbler | Insectivore |
| Piciformes | Picidae | Speckled Piculet | Insectivore |
| Piciformes | Picidae | Rufous woodpecker | Insectivore |
| Piciformes | Picidae | Scaly-bellied Woodpecker | Insectivore |
| Piciformes | Picidae | Great Slaty woodpecker | Insectivore |
| Piciformes | Picidae | Lesser Goldenback | Insectivore |
| Piciformes | Picidae | Grey-headed Woodpecker | Insectivore |
| Piciformes | Picidae | Lesser Yellownape | Insectivore |
| Piciformes | Picidae | Greater Yellownape | Insectivore |
| Piciformes | Picidae | Greater Goldenback | Insectivore |
| Piciformes | Picidae | Himalayan Goldenback | Insectivore |
| Piciformes | Picidae | Grey-capped Pygmy Woodpecker | Insectivore |
| Piciformes | Picidae | Brown headed pygmy woodpecker | Insectivore |
| Piciformes | Picidae | Streaked-throated Woodpecker | Insectivore |
| Piciformes | Picidae | Fulvous-brested Woodpecker | Insectivore |
| Psittaciformes | Psittaculidae | Red-breasted Parakeet | frugivore |
| Psittaciformes | Psittaculidae | Alexandrine Parakeet | frugivore |
| Psittaciformes | Psittaculidae | Slaty-headed Parakeet | frugivore |
| Psittaciformes | Psittaculidae | Plum-headed Parakeet | frugivore |
| Psittaciformes | Psittaculidae | Rose-ringed Parakeet | frugivore |
| Passeriformes | Pycnonotiadae | Black-crested Bulbul | frugivore+Insectivore |
| Passeriformes | Pycnonotiadae | Ashy Bulbul | frugivore+Insectivore |
| Passeriformes | Pycnonotiadae | Black Bulbul | frugivore+Insectivore |
| Passeriformes | Pycnonotiadae | Red-whiskered Bulbul | frugivore+Insectivore |
| Passeriformes | Pycnonotiadae | Red-vented Bulbul | frugivore+Insectivore |
| Passeriformes | Pycnonotiadae | Himalayan Bulbul | omnivore |
| gruiformes | Rallidae | White-breasted Waterhen | carnivore |
| gruiformes | rallidae | Common Moorhen | omnivore |
| Charadriiformes | Recurvirostridae | Black-winged stilt | carnivore |
| Passeriformes | Rhipiduridae | White-throated Fantail | Insectivore |
| Passeriformes | Sittidae | Velvet-fronted Nuthatch | Insectivore |
| Passeriformes | Sittidae | Chestnut-bellied Nuthatch | Insectivore |
| Passeriformes | Stenostiridae | Yellow-bellied Fantail | Insectivore |
| Passeriformes | Stenostiridae | Grey-headed Canary Flycatcher | Insectivore |
| Strigiformes | Strigidae | Asian-barred Owlet | carnivore |
| Strigiformes | Strigidae | Spotted owlet | carnivore |
| Strigiformes | Strigidae | Tawny fish owl | carnivore |
| Strigiformes | Strigidae | Brown Wood Owl | carnivore |
| Strigiformes | Strigidae | Spot-bellied Eagle Owl | carnivore |
| Strigiformes | Strigidae | Jungle Owlet | carnivore |
| Strigiformes | Strigidae | Asian Barred Owlet | carnivore |
| Passeriformes | Sturnidae | Brahminy Starling | omnivore |
| Passeriformes | Sturnidae | Asian Pied Starling | omnivore |
| Passeriformes | Sturnidae | Spot-winged Starling | omnivore |
| Passeriformes | Sturnidae | Chestnut-tailed Starling | omnivore |
| Passeriformes | Sturnidae | Jungle Myna | omnivore |
| Passeriformes | Sturnidae | Common Myna | omnivore |
| Passeriformes | Sylviidae | Common Chiffchaff | Insectivore |
| Passeriformes | Sylviidae | Blyth's Reed Wabler | Insectivore |
| Passeriformes | Sylviidae | Lesser Whitethroat | Insectivore |
| Passeriformes | Tichodromadidae | Wall creeper | Insectivore |
| Passeriformes | Timaliidae | White-bellied Erpornis | Insectivore |
| Passeriformes | Timaliidae | Rusty-cheeked Scimitar Babbler | Insectivore |
| Passeriformes | Timaliidae | Black-chinned Yuhina | Insectivore |
| Passeriformes | Timaliidae | Whiskered Yuhina | Insectivore |
| Passeriformes | Timaliidae | Striated Laughingthrush | Insectivore |
| Passeriformes | Timaliidae | Chestnut-crowned Laughingthrush | Insectivore |
| Passeriformes | Timaliidae | Streaked Laughingthrush | Insectivore |
| Passeriformes | Timaliidae | Red-billed Leiothrix | Insectivore |
| Passeriformes | Timaliidae | White-throated Laughingthrush | Insectivore |
| Passeriformes | Timaliidae | Black-chinned Babbler | Insectivore |
| Passeriformes | Timaliidae | White-crested Laughingthrush | Insectivore |
| Passeriformes | Timaliidae | Jungle Babbler | Insectivore |
| Passeriformes | Turdidae | Tickle's Thrush | Insectivore |
| Passeriformes | Turdidae | Grey-winged Blackbird | Insectivore |
| Passeriformes | Turdidae | Orange-headed Thrush | Insectivore |
| Passeriformes | Turdidae | Black-throated Thrush | Insectivore |
| Passeriformes | Turdidae | Blue-whistling Thrush | Insectivore |
| Bucerotiformes | Upupidae | Hoopoe | Insectivore |
| Passeriformes | Vangidae | Common Woodshrike | Insectivore |
| Passeriformes | Zosteropidae | Oriental White-eye | Insectivore |

**Section 5: Generalized Linear Regression Models of species richness**

Table S5.1: Most parsimonious model (<2AICc) predicting the richness of overall species and various feeding guild

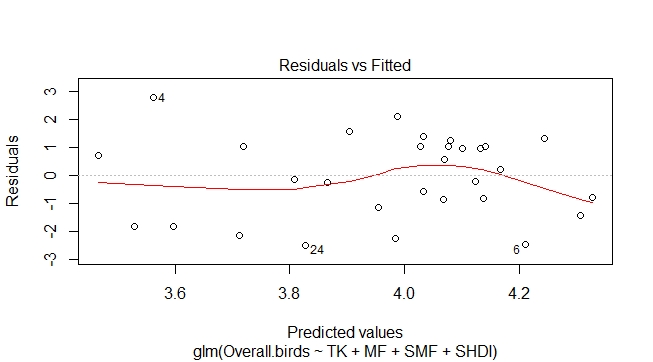
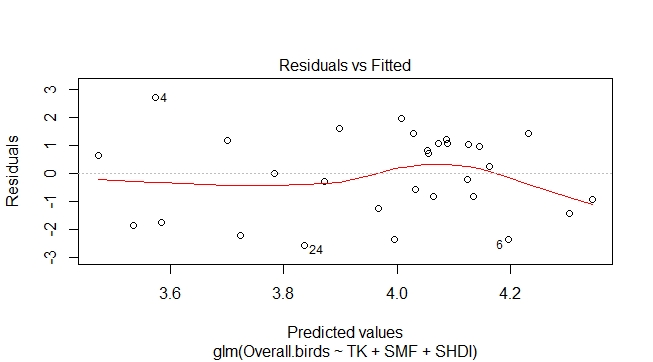
|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Guild | **Landscape variables** | **df** | **logLik** | **AICc** | **Δ AICc** | **wt.** |
| Bird species richness | TK+SMF+SHDI | 4 | -118 | 245 | 0 | 0.463 |
| TK+MF+SMF+SHDI | 5 | -118 | 248 | 2.7 | 0.122 |
| Carnivore richness | WB+BR | 3 | -52 | 112 | 0 | 0.32 |
| BR | 2 | -54 | 112 | 0.3 | 0.28 |
| WB | 2 | -54 | 112 | 0.73 | 0.22 |
| BR+SHDI | 3 | -53 | 113 | 1.25 | 0.17 |
| Granivore richness | HH/AG+TK+BR+ED | 6 | -51 | 118 | 0 | 0.19 |
| HH/AG+TK+BR | 5 | -53 | 119 | 0.61 | 0.14 |
| HH/AG+TK+BR+SC+ED | 7 | -50 | 119 | 0.71 | 0.13 |
| HH/AG+TK+BR+SC | 6 | -52 | 119 | 0.77 | 0.13 |
| TK+BR+SC+ED | 6 | -52 | 119 | 0.93 | 0.12 |
| TK+BR+SC | 5 | -53 | 119 | 1.16 | 0.11 |
| HH/AG+TK+BR+MF+SC | 7 | -50 | 120 | 1.44 | 0.09 |
| TK+BR+MF+SC | 6 | -52 | 120 | 1.85 | 0.08 |
| Insectivore richness | TK+DRF+SMF | 4 | -100 | 209 | 0 | 0.28 |
| TK+SMF | 3 | -101 | 210 | 0.39 | 0.23 |
| TK+DRF+SMF+ED | 5 | -99 | 210 | 0.57 | 0.21 |
| TK+DRF+MF+SMF | 5 | -99 | 211 | 1.19 | 0.15 |
| TK+MF+SMF | 4 | -101 | 211 | 1.55 | 0.13 |
| Furig+insectivore richness | DRF+ED | 3 | -48 | 104 | 0 | 0.389 |
| HH/AG+DRF+ED | 4 | -48 | 106 | 2.2 | 0.128 |
| Nectarivore richness | HH/AG+ED | 4 | 24 | -39 | 0 | 0.35 |
| SC+ED | 4 | 24 | -37 | 1.2 | 0.19 |
| HH/AG | 3 | 22 | -37 | 1.2 | 0.19 |
| ED | 3 | 22 | -37 | 1.8 | 0.14 |
| HH/AG+SC+ED | 5 | 25 | -37 | 1.9 | 0.13 |
| Omnivore richness | HH/AG+WB | 4 | -67 | 144 | 0 | 0.38 |
| HH/AG+BR | 4 | -67 | 144 | 0.45 | 0.3 |
| HH/AG | 3 | -69 | 145 | 1.46 | 0.18 |
| \*Piscivore richness | WB | 2 | 1.8 | 3.4 | - | - |
| \*Frugivore richness | WB | 3 | -53 | 113 | - | - |

AICc: AICc score for the model, ΔAICc: delta AICc between any model and the ‘best’ model; logLik.: log-likelihood of model; wt: weight of the model; landscape variable; HH/AG= Human habitation with agriculture, BR= Barren land, DRF= Dry Riverine, MF= Mixed forest, MRF= Moist riverine forest, SF=Sal forest, SMF= Sal mixed forest, SC=Scrubland, TK=Teak plantation, WB=Water body.

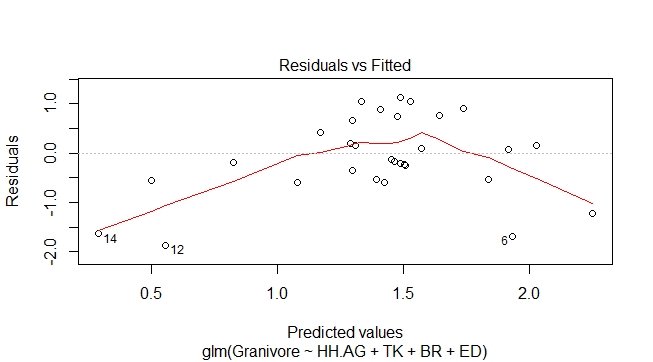
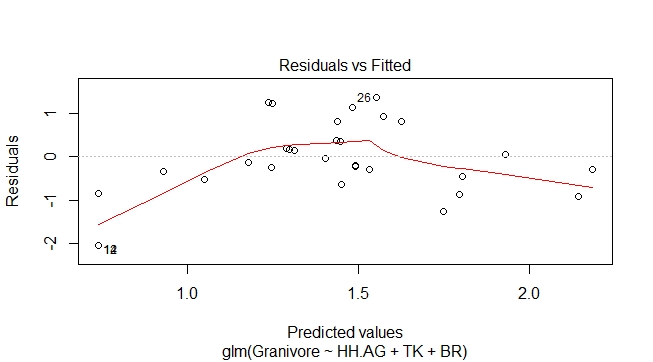
\*Univariate GLM.

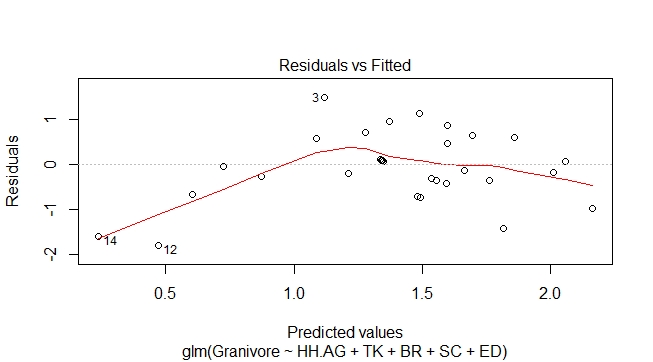
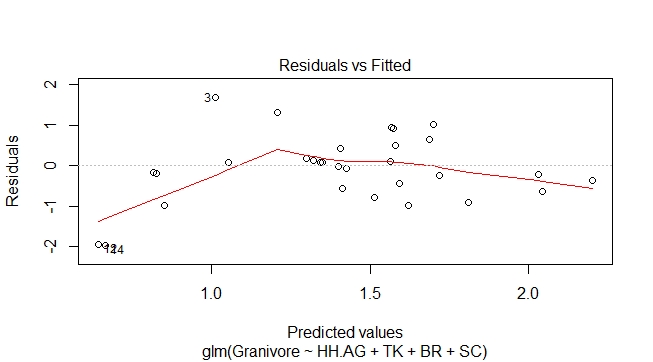
**Section 6: Residual plots of most parsimonious model (<2AICc) predicting the richness of overall species and various feeding guild**

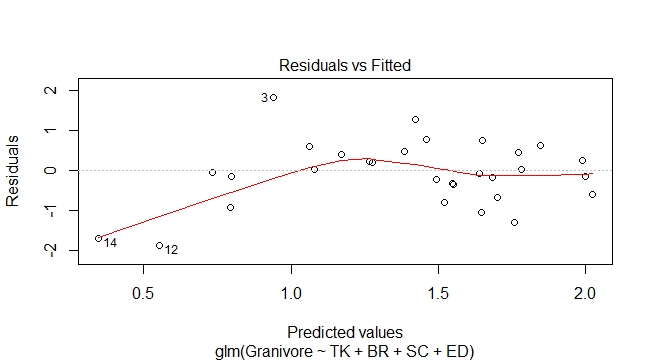
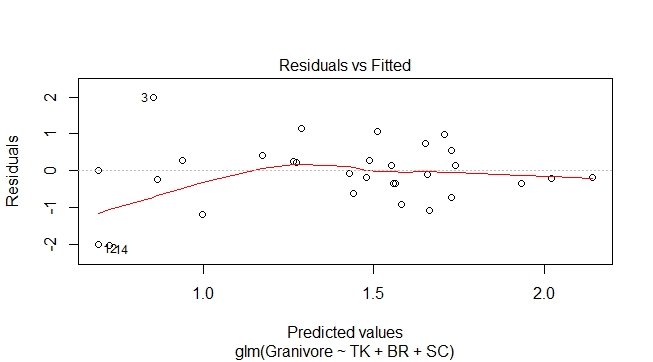
**6.1 Overall bird richness**

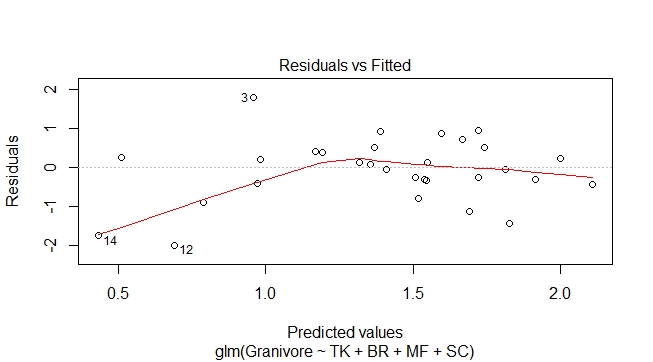
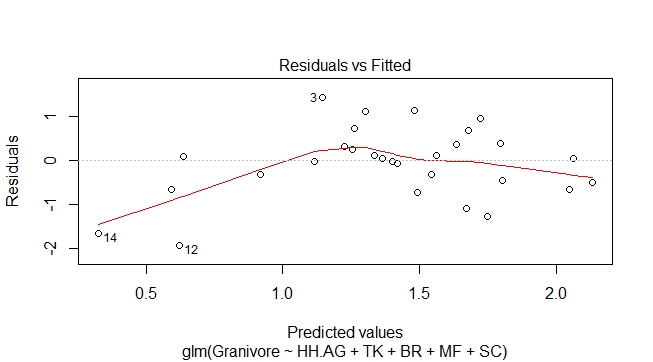


**6.3 Granivore richness**

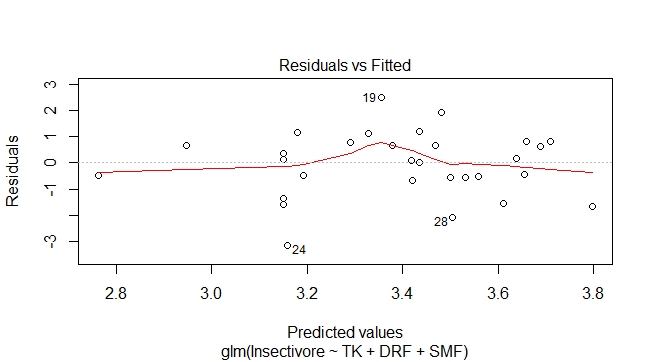
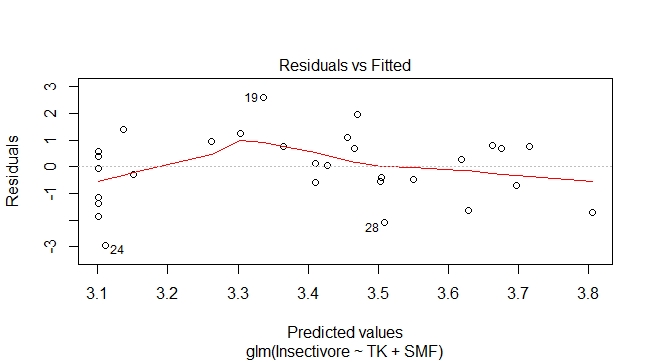
 

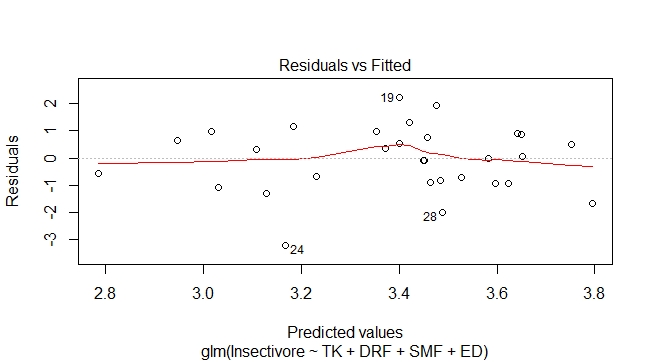
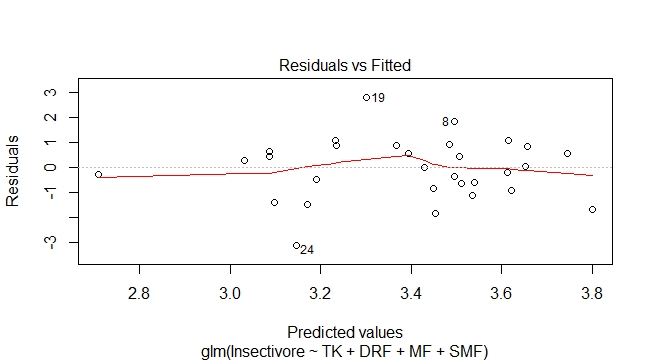
 

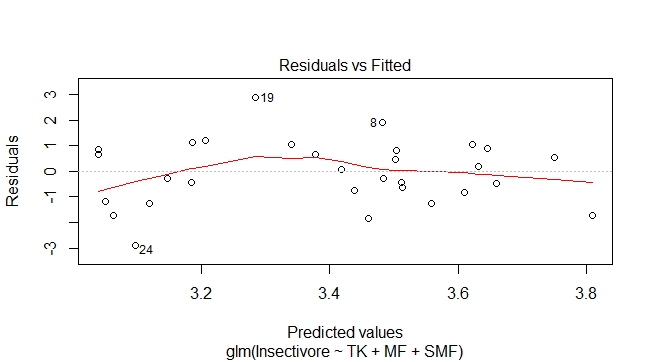
 



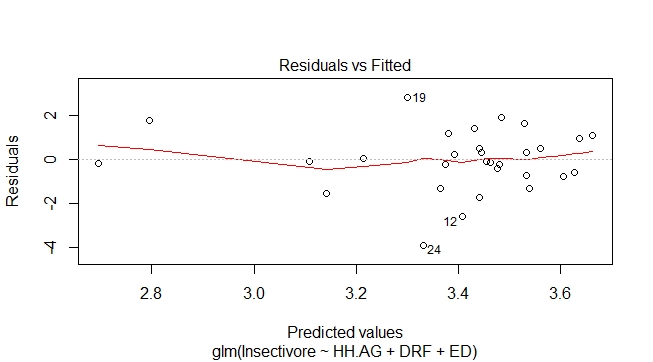
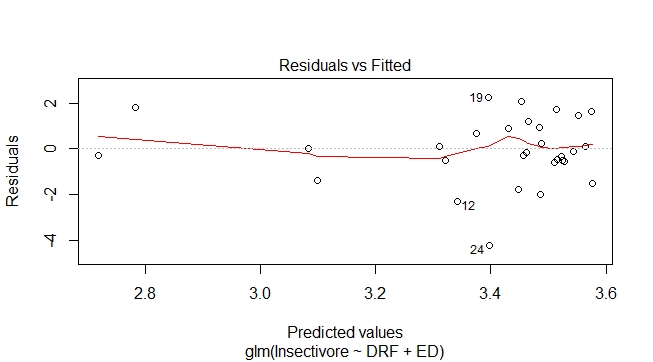
**6.4: Insectivore richness**

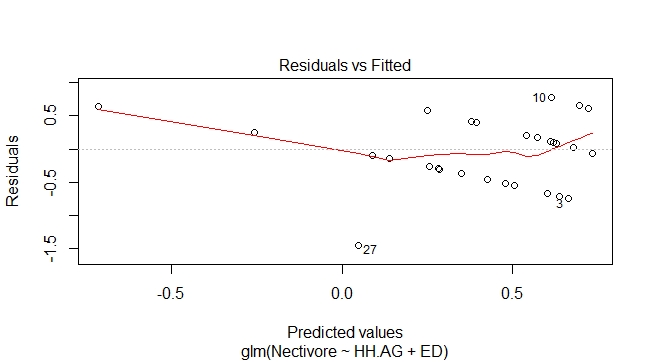
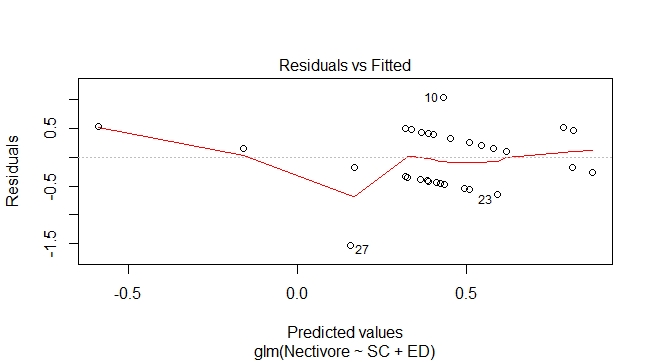
 

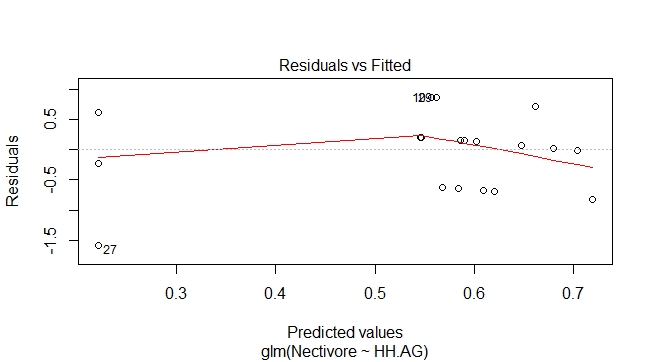
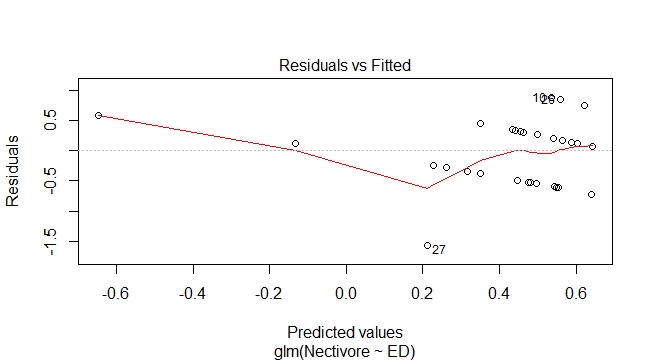


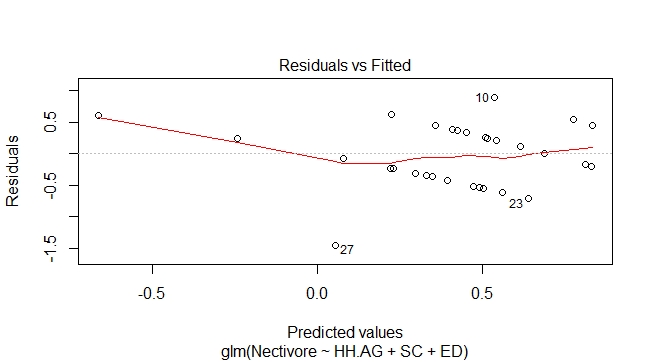
**6.5 Frugi+inectivore richness**



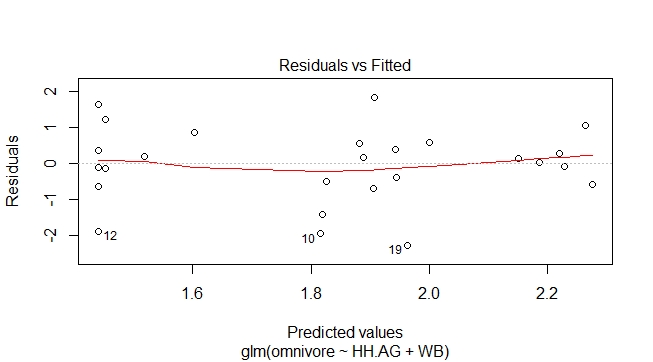
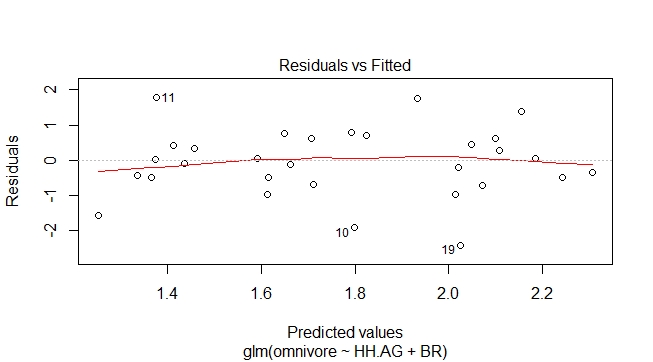
**6.6 Nectarivore richness**

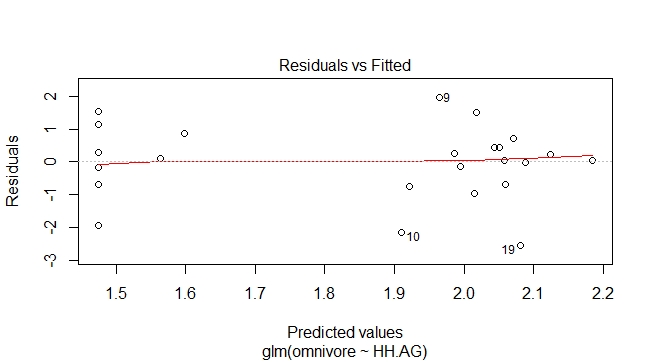
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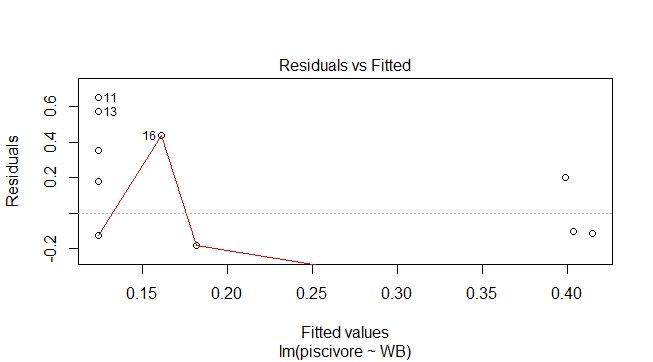
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**6.6 Omnivore richness**



**6.7 Piscivore richness**



**6.8 Frugivore richness**

