|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Appendix S1. All models explaining abundance (λ) and detectability (*p*) of salamanders in terrestrial habitat\* | | | | | | |
| *Detection Models* | | | *K* | *∆AIC* | *Model Likelihood* | *ωi* |
| *Plethodon shermani* | |  |  |  |  |  |
|  | Global2 | λ(•)ρ(Date+Time+Time2+Rain+Temp+Temp2) | 9 | 0.00 | 1.00 | 1.00 |
|  | Global | λ(•)ρ(Date+Time+Rain+Temp) | 7 | 24.98 | 0.00 | 0.00 |
|  | Rainfall only | λ(•)ρ(Rain) | 4 | 278.76 | 0.00 | 0.00 |
|  | Weather only | λ(•)ρ(Rain+Temp) | 5 | 280.76 | 0.00 | 0.00 |
|  | Intercept-only | λ(•)ρ(•) | 3 | 346.18 | 0.00 | 0.00 |
| *D. ocoee/E. wilderae* | |  |  |  |  |  |
|  | Global2 | λ(•)ρ(Date+Time+Time2+Rain+Temp+Temp2) | 9 | 0.00 | 1.00 | 1.00 |
|  | Global | λ(•)ρ(Date+Time+Rain+Temp) | 7 | 25.11 | 0.00 | 0.00 |
|  | Rainfall only | λ(•)ρ(Rain) | 4 | 132.54 | 0.00 | 0.00 |
|  | Weather only | λ(•)ρ(Rain+Temp) | 5 | 143.22 | 0.00 | 0.00 |
|  | Intercept-only | λ(•)ρ(•) | 3 | 197.63 | 0.00 | 0.00 |
|  | |  |  |  |  |  |
| *Abundance Models* | |  | *K* | *∆AIC* | *Model Likelihood* | *ωi* |
| *Plethodon shermani* | |  |  |  |  |  |
|  | Simple Topo. | λ(Aspect+Elev+Age)ρ(Global2) | 13 | 0.00 | 1.00 | 0.68 |
|  | Complex Topo. | λ(TPI+Aspect+Elev+Age)ρ(Global2) | 14 | 2.40 | 0.30 | 0.20 |
|  | Global | λ(Leaf+Stream+TWI+TPI+Aspect+Elev+Age)ρ(Global2) | 17 | 3.59 | 0.17 | 0.11 |
|  | Local Factors | λ(Leaf+Stream+TPI+Aspect+Stand)ρ(Global2) | 15 | 10.14 | 0.01 | 0.01 |
|  | Wetness/Elev. | λ(TWI+Elev+Age)ρ(Global2) | 12 | 11.83 | 0.00 | 0.00 |
|  | Intercept-only | λ(•)ρ(Global2) | 9 | 21.31 | 0.00 | 0.00 |
|  | Stand Age | λ(Age)ρ(Global2) | 10 | 21.45 | 0.00 | 0.00 |
|  | Wetness | λ(TWI+Stand)ρ(Global2) | 11 | 22.14 | 0.00 | 0.00 |
| *D. ocoee/E. wilderae* | |  |  |  |  |  |
|  | Global | λ(Leaf+Stream+TWI+TPI+Aspect+Elev+Age)ρ(Global2) | 17 | 0.00 | 1.10 | 0.68 |
|  | Local Factors | λ(Leaf+Stream+TPI+Aspect+Age)ρ(Global2) | 15 | 1.70 | 0.43 | 0.29 |
|  | Complex Topo | λ(TPI+Aspect+Elev+Age)ρ(Global2) | 14 | 7.19 | 0.03 | 0.02 |
|  | Simple Topo | λ(Aspect+Elev+Age)ρ(Global2) | 13 | 8.01 | 0.02 | 0.01 |
|  | Wetness/Elev. | λ(TWI+Elev+Age)ρ(Global2) | 12 | 34.58 | 0.00 | 0.00 |
|  | Wetness | λ(TWI+Stand)ρ(Global2) | 11 | 39.72 | 0.00 | 0.00 |
|  | Stand Age | λ(Age)ρ(Global2) | 10 | 40.86 | 0.00 | 0.00 |
|  | Intercept-only | λ(•)ρ(Global2) | 9 | 51.10 | 0.00 | 0.00 |
|  |  |  |  |  |  |  |
| *Land Use Models* | |  | *K* | *∆AIC* | *Model Likelihood* | *ωi* |
| *Plethodon shermani* | |  |  |  |  |  |
|  | Exponential Age | λ(Aspect+Elev+exp(Age))ρ(Global2) | 13 | 0.00 | 1.00 | 0.37 |
|  | Linear Age | λ(Aspect+Elev+Age)ρ(Global2) | 13 | 0.79 | 0.67 | 0.25 |
|  | Logistic Age | λ(Aspect+Elev+log(Age))ρ(Global2) | 13 | 1.11 | 0.57 | 0.21 |
|  | Exponential Distance | λ(Aspect+Elev+exp(Age)+ Dis+DistXexp(Age))ρ(Global2) | 15 | 3.14 | 0.21 | 0.08 |
|  | Linear Distance | λ(Aspect+Elev+Age+Dist+DistXAge)ρ(Global2) | 15 | 3.93 | 0.14 | 0.05 |
|  | Logistic Distance | λ(Aspect+Elev+log(Age)+Dist+DistXlog(Age))ρ(Global2) | 15 | 4.11 | 0.13 | 0.04 |
| *D. ocoee/E. wilderae* | |  |  |  |  |  |
|  | Logistic Distance | λ(Leaf+Stream+TWI+TPI+Aspect+Elev+log(Age)+Dist+log(Age)XDist)ρ(Global2) | 19 | 0.00 | 1.00 | 0.70 |
|  | Linear Distance | λ(Leaf+Stream+TWI+TPI+Aspect+Elev+Age+Dist+AgeXDist)ρ(Global2) | 19 | 3.45 | 0.18 | 0.12 |
|  | Logistic Age | λ(Leaf+Stream+TWI+TPI+Aspect+Elev+log(Age))ρ(Global2) | 17 | 4.10 | 0.13 | 0.09 |
|  | Exponential Distance | λ(Leaf+Stream+TWI+TPI+Aspect+Elev+exp(Age)+Dist+exp(Age)XDist)ρ(Global2) | 19 | 5.43 | 0.07 | 0.05 |
|  | Linear Age | λ(Leaf+Stream+TWI+TPI+Aspect+Elev+Age)ρ(Global2) | 17 | 6.21 | 0.04 | 0.03 |
|  | Exponential Age | λ(Leaf+Stream+TWI+TPI+Aspect+Elev+exp(Age))ρ(Global2) | 17 | 7.74 | 0.02 | 0.01 |
|  |  |  |  |  |  |  |
| *Threshold Models* | |  | *K* | *∆AIC* | *Model Likelihood* | *ωi* |
| *Plethodon shermani* | |  |  |  |  |  |
|  | 100 Year Threshold | λ(Aspect+Elev+Age+max(0, Age*-100*))ρ(Global2) | 14 | 0.00 | 1.00 | 0.91 |
|  | 75 Year Threshold | λ(Aspect+Elev+Age+max(0, Age*-75*))ρ(Global2) | 14 | 5.20 | 0.07 | 0.04 |
|  | No Threshold | λ(Aspect+Elev+Age)ρ(Global2) | 13 | 7.14 | 0.03 | 0.02 |
|  | 25 Year Threshold | λ(Aspect+Elev+Age+max(0, Age*-25*))ρ(Global2) | 14 | 7.21 | 0.03 | 0.02 |
|  | 50 Year Threshold | λ(Aspect+Elev+Age+max(0, Age*-50*))ρ(Global2) | 14 | 8.57 | 0.01 | 0.01 |
| *D. ocoee/E. wilderae* | |  |  |  |  |  |
|  | 100 Year Threshold | λ(Leaf+Stream+TWI+TPI+Aspect+Elev+Age+Dist+AgeXDist+max(0, Age*-100*))ρ(Global2) | 20 | 0.00 | 1.00 | 0.99 |
|  | 75 Year Threshold | λ(Leaf+Stream+TWI+TPI+Aspect+Elev+Age+Dist+AgeXDist+max(0, Age*-75*))ρ(Global2) | 20 | 9.73 | 0.01 | 0.01 |
|  | 50 Year Threshold | λ(Leaf+Stream+TWI+TPI+Aspect+Elev+Age+Dist+AgeXDist+max(0, Age*-50*))ρ(Global2) | 20 | 15.14 | 0.00 | 0.00 |
|  | 25 Year Threshold | λ(Leaf+Stream+TWI+TPI+Aspect+Elev+Age+Dist+AgeXDist+max(0, Age*-25*))ρ(Global2) | 20 | 15.52 | 0.00 | 0.00 |
|  | No Threshold | λ(Leaf+Stream+TWI+TPI+Aspect+Elev+Age+Dist+AgeXDist)ρ(Global2) | 19 | 17.78 | 0.00 | 0.00 |
| \* The • symbol in certain models indicates that no covariates were fitted to abundance. *K* represents the number of parameters in a model. ∆AICc represents the difference in AICc value between each model and the best model in the set. Model likelihood was calculated as e-∆AIC/2. ω*i* gives the Akaike weight for each model. | | | | | | |