Tania's Tigers

June 13, 2017

require(AICcmodavg)

## Loading required package: AICcmodavg

require(lme4)

## Loading required package: lme4

## Loading required package: Matrix

tania<-read.csv("C:/Users/spm1978/Desktop/Tania.csv")  
  
m1<-glmer(Tiger~Forest2+Urban2+Ag2 +(1|PatchName)+(1|Year), data=tania, family=poisson)  
m2<-glmer(Tiger~Ag2 +(1|PatchName)+(1|Year), data=tania, family=poisson)  
m3<-glmer(Tiger~Urban2 +(1|PatchName)+(1|Year), data=tania, family=poisson)  
m4<-glmer(Tiger~Forest2 +(1|PatchName)+(1|Year), data=tania, family=poisson)  
m5<-glmer(Tiger~Forest2+Urban2 +(1|PatchName)+(1|Year), data=tania, family=poisson)  
m6<-glmer(Tiger~Forest2+Ag2 +(1|PatchName)+(1|Year), data=tania, family=poisson)  
m7<-glmer(Tiger~Urban2+Ag2 +(1|PatchName)+(1|Year), data=tania, family=poisson)  
  
aictab(c(m1,m2,m3,m4,m5,m6,m7))

##   
## Model selection based on AICc:  
##   
## K AICc Delta\_AICc AICcWt Cum.Wt LL  
## Mod2 4 299.28 0.00 0.33 0.33 -145.49  
## Mod7 5 299.76 0.48 0.26 0.59 -144.65  
## Mod6 5 300.63 1.35 0.17 0.76 -145.08  
## Mod1 6 301.95 2.67 0.09 0.85 -144.64  
## Mod4 4 302.93 3.65 0.05 0.90 -147.31  
## Mod3 4 303.01 3.73 0.05 0.95 -147.35  
## Mod5 5 303.12 3.84 0.05 1.00 -146.33

summary(m1)

## Generalized linear mixed model fit by maximum likelihood (Laplace  
## Approximation) [glmerMod]  
## Family: poisson ( log )  
## Formula: Tiger ~ Forest2 + Urban2 + Ag2 + (1 | PatchName) + (1 | Year)  
## Data: tania  
##   
## AIC BIC logLik deviance df.resid   
## 301.3 318.6 -144.6 289.3 127   
##   
## Scaled residuals:   
## Min 1Q Median 3Q Max   
## -2.4068 -0.5051 -0.3695 -0.0186 4.3495   
##   
## Random effects:  
## Groups Name Variance Std.Dev.  
## PatchName (Intercept) 1.861 1.364   
## Year (Intercept) 0.131 0.362   
## Number of obs: 133, groups: PatchName, 19; Year, 7  
##   
## Fixed effects:  
## Estimate Std. Error z value Pr(>|z|)   
## (Intercept) -1.14574 0.40244 -2.847 0.00441 \*\*  
## Forest2 0.00994 0.10794 0.092 0.92663   
## Urban2 0.11132 0.11783 0.945 0.34479   
## Ag2 0.35585 0.19924 1.786 0.07409 .   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Correlation of Fixed Effects:  
## (Intr) Forst2 Urban2  
## Forest2 0.006   
## Urban2 0.030 0.747   
## Ag2 0.011 -0.620 -0.305

summary(m2)

## Generalized linear mixed model fit by maximum likelihood (Laplace  
## Approximation) [glmerMod]  
## Family: poisson ( log )  
## Formula: Tiger ~ Ag2 + (1 | PatchName) + (1 | Year)  
## Data: tania  
##   
## AIC BIC logLik deviance df.resid   
## 299.0 310.5 -145.5 291.0 129   
##   
## Scaled residuals:   
## Min 1Q Median 3Q Max   
## -2.0529 -0.5091 -0.3688 0.0502 4.1159   
##   
## Random effects:  
## Groups Name Variance Std.Dev.  
## PatchName (Intercept) 2.108 1.4518   
## Year (Intercept) 0.163 0.4037   
## Number of obs: 133, groups: PatchName, 19; Year, 7  
##   
## Fixed effects:  
## Estimate Std. Error z value Pr(>|z|)   
## (Intercept) -1.1737 0.4254 -2.759 0.0058 \*\*  
## Ag2 0.2996 0.1518 1.974 0.0484 \*   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Correlation of Fixed Effects:  
## (Intr)  
## Ag2 0.023

summary(m3)

## Generalized linear mixed model fit by maximum likelihood (Laplace  
## Approximation) [glmerMod]  
## Family: poisson ( log )  
## Formula: Tiger ~ Urban2 + (1 | PatchName) + (1 | Year)  
## Data: tania  
##   
## AIC BIC logLik deviance df.resid   
## 302.7 314.3 -147.3 294.7 129   
##   
## Scaled residuals:   
## Min 1Q Median 3Q Max   
## -1.7738 -0.5219 -0.3797 -0.1607 3.4088   
##   
## Random effects:  
## Groups Name Variance Std.Dev.  
## PatchName (Intercept) 2.7200 1.6492   
## Year (Intercept) 0.1208 0.3475   
## Number of obs: 133, groups: PatchName, 19; Year, 7  
##   
## Fixed effects:  
## Estimate Std. Error z value Pr(>|z|)   
## (Intercept) -1.20032 0.45869 -2.617 0.00887 \*\*  
## Urban2 0.03655 0.07784 0.470 0.63868   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Correlation of Fixed Effects:  
## (Intr)  
## Urban2 0.045

summary(m4)

## Generalized linear mixed model fit by maximum likelihood (Laplace  
## Approximation) [glmerMod]  
## Family: poisson ( log )  
## Formula: Tiger ~ Forest2 + (1 | PatchName) + (1 | Year)  
## Data: tania  
##   
## AIC BIC logLik deviance df.resid   
## 302.6 314.2 -147.3 294.6 129   
##   
## Scaled residuals:   
## Min 1Q Median 3Q Max   
## -1.6861 -0.5128 -0.3813 -0.2166 3.3854   
##   
## Random effects:  
## Groups Name Variance Std.Dev.  
## PatchName (Intercept) 2.7359 1.654   
## Year (Intercept) 0.1436 0.379   
## Number of obs: 133, groups: PatchName, 19; Year, 7  
##   
## Fixed effects:  
## Estimate Std. Error z value Pr(>|z|)   
## (Intercept) -1.21049 0.46293 -2.615 0.00893 \*\*  
## Forest2 0.03058 0.05580 0.548 0.58360   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Correlation of Fixed Effects:  
## (Intr)  
## Forest2 -0.002

summary(m5)

## Generalized linear mixed model fit by maximum likelihood (Laplace  
## Approximation) [glmerMod]  
## Family: poisson ( log )  
## Formula: Tiger ~ Forest2 + Urban2 + (1 | PatchName) + (1 | Year)  
## Data: tania  
##   
## AIC BIC logLik deviance df.resid   
## 302.7 317.1 -146.3 292.7 128   
##   
## Scaled residuals:   
## Min 1Q Median 3Q Max   
## -2.1345 -0.5193 -0.3752 -0.1148 3.3407   
##   
## Random effects:  
## Groups Name Variance Std.Dev.  
## PatchName (Intercept) 2.2779 1.5093   
## Year (Intercept) 0.1147 0.3386   
## Number of obs: 133, groups: PatchName, 19; Year, 7  
##   
## Fixed effects:  
## Estimate Std. Error z value Pr(>|z|)   
## (Intercept) -1.17129 0.42896 -2.731 0.00632 \*\*  
## Forest2 0.12500 0.08689 1.439 0.15027   
## Urban2 0.16791 0.11722 1.432 0.15203   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Correlation of Fixed Effects:  
## (Intr) Forst2  
## Forest2 0.032   
## Urban2 0.048 0.766

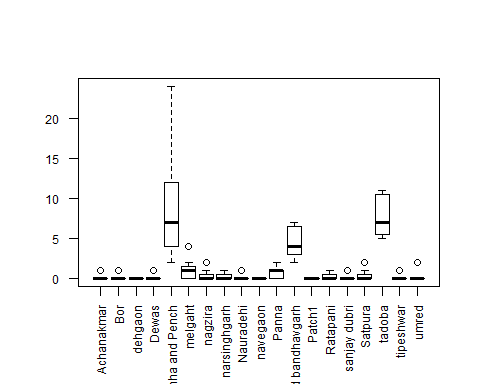
summary(m6)

## Generalized linear mixed model fit by maximum likelihood (Laplace  
## Approximation) [glmerMod]  
## Family: poisson ( log )  
## Formula: Tiger ~ Forest2 + Ag2 + (1 | PatchName) + (1 | Year)  
## Data: tania  
##   
## AIC BIC logLik deviance df.resid   
## 300.2 314.6 -145.1 290.2 128   
##   
## Scaled residuals:   
## Min 1Q Median 3Q Max   
## -2.1777 -0.4920 -0.3633 -0.0321 4.5458   
##   
## Random effects:  
## Groups Name Variance Std.Dev.  
## PatchName (Intercept) 1.9869 1.4096   
## Year (Intercept) 0.1527 0.3907   
## Number of obs: 133, groups: PatchName, 19; Year, 7  
##   
## Fixed effects:  
## Estimate Std. Error z value Pr(>|z|)   
## (Intercept) -1.16175 0.41529 -2.797 0.00515 \*\*  
## Forest2 -0.06541 0.07297 -0.896 0.37002   
## Ag2 0.41143 0.19749 2.083 0.03723 \*   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Correlation of Fixed Effects:  
## (Intr) Forst2  
## Forest2 -0.027   
## Ag2 0.030 -0.636

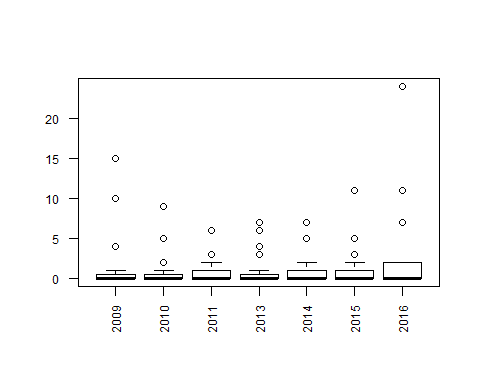
summary(m7)

## Generalized linear mixed model fit by maximum likelihood (Laplace  
## Approximation) [glmerMod]  
## Family: poisson ( log )  
## Formula: Tiger ~ Urban2 + Ag2 + (1 | PatchName) + (1 | Year)  
## Data: tania  
##   
## AIC BIC logLik deviance df.resid   
## 299.3 313.7 -144.6 289.3 128   
##   
## Scaled residuals:   
## Min 1Q Median 3Q Max   
## -2.3985 -0.5014 -0.3692 -0.0249 4.3906   
##   
## Random effects:  
## Groups Name Variance Std.Dev.  
## PatchName (Intercept) 1.8626 1.365   
## Year (Intercept) 0.1317 0.363   
## Number of obs: 133, groups: PatchName, 19; Year, 7  
##   
## Fixed effects:  
## Estimate Std. Error z value Pr(>|z|)   
## (Intercept) -1.14598 0.40270 -2.846 0.00443 \*\*  
## Urban2 0.10322 0.07839 1.317 0.18796   
## Ag2 0.36727 0.15667 2.344 0.01907 \*   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1  
##   
## Correlation of Fixed Effects:  
## (Intr) Urban2  
## Urban2 0.039   
## Ag2 0.018 0.305

boxplot(Tiger~PatchName, data=tania, las=2, cex.axis=0.75)



boxplot(Tiger~Year, data=tania, las=2, cex.axis=0.75)



plot(Tiger~Ag2, data=tania)

