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Results for: 2009.mtw

Poisson Regression Analysis: Tiger versus Forest, Urban, Agriculture

Method

Link function	Natural log
Rows used	19

Deviance Table

Source	DF	Seq Dev	Contribution	Adj Dev	Adj Mean	Chi-Square	P-Value
Regression	3	22.823	40.03%	22.8228	7.6076	22.82	0.000
Forest	1	18.492	32.43%	0.7510	0.7510	0.75	0.386
Urban	1	1.922	3.37%	0.3517	0.3517	0.35	0.553
Agriculture	1	2.409	4.23%	2.4095	2.4095	2.41	0.121
Error	15	34.193	59.97%	34.1928	2.2795		
Total	18	57.016	100.00%				

Model Summary

Deviance R-Sq	Deviance R-Sq(adj)	AIC
40.03%	34.77%	54.27

Coefficients

Term	Coef	SE Coef	95% CI	Z-Value	P-Value	VIF
Constant	-0.744	0.379	(-1.488, -0.001)	-1.96	0.050	
Forest	-0.512	0.581	(-1.651, 0.627)	-0.88	0.378	23.43
Urban	0.232	0.381	(-0.514, 0.978)	0.61	0.542	2.87
Agriculture	1.173	0.739	(-0.275, 2.621)	1.59	0.112	26.60

Regression Equation

$$\text{Tiger} = \exp(Y')$$

$$Y' = -0.744 - 0.512\ \text{Forest} + 0.232\ \text{Urban} + 1.173\ \text{Agriculture}$$

Goodness-of-Fit Tests

```
Test      DF  Estimate     Mean  Chi-Square  P-Value
Deviance  15  34.19284  2.27952       34.19    0.003
Pearson   15  52.69158  3.51277       52.69    0.000


Fits and Diagnostics for Unusual Observations

Obs  Tiger   Fit  SE Fit      95% CI     Resid  Std Resid  Del Resid        HI
 Cook's D
  3   6.00  6.60    2.57  (3.08, 14.14)  -0.24      -4.72      -4.65  0.997502
  2155.66
 10   0.00  0.94    0.73  (0.21,  4.30)  -1.37      -2.08      -1.76  0.565951
     0.71
 11   0.00  1.48    0.73  (0.56,  3.90)  -1.72      -2.15      -1.95  0.363139
     0.33
 12   0.00  1.10    0.74  (0.30,  4.10)  -1.48      -2.09      -1.81  0.495248
     0.53
 14   7.00  0.92    0.30  (0.48,  1.75)   4.03       4.25       4.55  0.099167
     1.23

Obs     DFITS
  3  -92.8582  R  X
 10   -1.6808  R
 11   -1.1503  R
 12   -1.4624  R
 14    2.2190  R

R  Large residual
X  Unusual X
```

Results for: 2010.mtw

Poisson Regression Analysis: Tiger versus forest, Urban, Agriculture

```
Method

Link function  Natural log
Rows used      19


Deviance Table

Source         DF  Seq Dev  Contribution  Adj Dev  Adj Mean  Chi-Square  P-Valu
e
Regression      3  30.0722        59.00%  30.0722   10.0241       30.07    0.00
0
  forest        1  26.3825        51.76%   0.1083    0.1083        0.11    0.74
2
  Urban         1   3.5022         6.87%   3.4593    3.4593        3.46    0.06
3
  Agriculture   1   0.1875         0.37%   0.1875    0.1875        0.19    0.66
5
Error          15  20.9003        41.00%  20.9003    1.3934
Total          18  50.9724       100.00%


Model Summary

Deviance   Deviance
    R-Sq  R-Sq(adj)    AIC
  59.00%     53.11%  38.59


Coefficients
```

```
Term           Coef  SE Coef       95% CI       Z-Value  P-Value    VIF
Constant     -1.228    0.471  (-2.150, -0.305)    -2.61    0.009
forest         0.37     1.16  ( -1.90,   2.64)     0.32    0.751  73.49
Urban         1.136    0.535  ( 0.087,  2.184)     2.12    0.034   9.65
Agriculture   -0.55     1.32  ( -3.14,   2.04)    -0.42    0.676  85.53


Regression Equation

Tiger  =  exp(Y')


Y' = -1.228 + 0.37 forest + 1.136 Urban - 0.55 Agriculture


Goodness-of-Fit Tests

Test      DF  Estimate     Mean  Chi-Square  P-Value
Deviance  15  20.90026  1.39335       20.90    0.140
Pearson   15  49.76105  3.31740       49.76    0.000


Fits and Diagnostics for Unusual Observations

Obs  Tiger   Fit  SE Fit      95% CI     Resid  Std Resid  Del Resid        HI
 Cook's D
  2   0.00  0.59    0.66  (0.07,  5.28)  -1.09      -2.13      -1.69  0.738099
     1.59
  3   7.00  7.40    2.72  (3.61, 15.20)  -0.15      -2.63      -2.61  0.996747
   520.16
  6   2.00  1.59    1.23  (0.35,  7.27)   0.31       1.50       1.56  0.956264
    13.30
 14   4.00  0.30    0.15  (0.11,  0.80)   3.66       3.80       4.13  0.075110
     1.01

Obs     DFITS
  2   -2.5249  R  X
  3  -45.6141  R  X
  6    7.2938     X
 14    2.0081  R

R  Large residual
X  Unusual X
```

Results for: 2011.mtw

Poisson Regression Analysis: Tiger versus Forest, Urban, Agriculture

```
Method

Link function  Natural log
Rows used      19


Deviance Table

Source          DF  Seq Dev  Contribution  Adj Dev  Adj Mean  Chi-Square  P-Valu
e
Regression       3  11.8471        45.53%  11.8471    3.9490       11.85    0.00
8
  Forest         1   0.4765         1.83%   0.0138    0.0138        0.01    0.90
7
  Urban          1   1.1386         4.38%   4.6275    4.6275        4.63    0.03
```

```
1
  Agriculture   1  10.2321        39.32%  10.2321   10.2321       10.23    0.00
1
Error          15  14.1733        54.47%  14.1733    0.9449
Total          18  26.0204       100.00%


Model Summary

Deviance   Deviance
    R-Sq  R-Sq(adj)    AIC
  45.53%     34.00%  36.16


Coefficients

Term           Coef  SE Coef       95% CI       Z-Value  P-Value   VIF
Constant     -1.181    0.459  (-2.080, -0.281)    -2.57    0.010
Forest       -0.082    0.692  (-1.438,  1.274)    -0.12    0.906  7.48
Urban        -1.421    0.834  (-3.055,  0.214)    -1.70    0.088  7.14
Agriculture   1.632    0.475  ( 0.702,  2.562)     3.44    0.001  2.93


Regression Equation

Tiger  =  exp(Y')


Y' = -1.181 - 0.082 Forest - 1.421 Urban + 1.632 Agriculture


Goodness-of-Fit Tests

Test      DF  Estimate     Mean  Chi-Square  P-Value
Deviance  15  14.17329  0.94489       14.17    0.512
Pearson   15  19.69819  1.31321       19.70    0.184


Fits and Diagnostics for Unusual Observations

Obs  Tiger    Fit  SE Fit      95% CI       Resid  Std Resid  Del Resid
HI  Cook's D
  3  1.000  0.959   0.974  (0.131, 7.019)   0.041       0.40       0.40  0.9891
11      3.61
  6  3.000  0.442   0.178  (0.200, 0.974)   2.526       2.62       2.74  0.0718
77      0.31
 11  1.000  0.700   0.665  (0.109, 4.509)   0.337       0.56       0.58  0.6323
38      0.15
 14  3.000  3.694   1.867  (1.372, 9.946)  -0.374      -1.57      -1.52  0.9431
96      9.54

Obs     DFITS
  3   3.79960     X
  6   1.11214  R
 11   0.77663     X
 14  -6.17595     X

R  Large residual
X  Unusual X
```

Results for: 2013.mtw

Poisson Regression Analysis: Tiger versus forest, Urban, Agriculture

Method

Link function Natural log
Rows used   19

Deviance Table

Source	DF	Seq Dev	Contribution	Adj Dev	Adj Mean	Chi-Square	P-Value
Regression	3	8.6424	17.67%	8.6424	2.8808	8.64	0.034
forest	1	3.0679	6.27%	2.6319	2.6319	2.63	0.105
Urban	1	4.7944	9.80%	5.2407	5.2407	5.24	0.022
Agriculture	1	0.7800	1.59%	0.7800	0.7800	0.78	0.377
Error	15	40.2638	82.33%	40.2638	2.6843		
Total	18	48.9062	100.00%				

Model Summary

Deviance R-Sq	Deviance R-Sq(adj)	AIC
17.67%	11.54%	65.01

Coefficients

Term	Coef	SE Coef	95% CI	Z-Value	P-Value	VIF
Constant	-0.353	0.319	(-0.978, 0.271)	-1.11	0.267	
forest	1.51	1.00	(-0.45, 3.47)	1.51	0.131	36.80
Urban	-1.717	0.869	(-3.420, -0.014)	-1.98	0.048	27.80
Agriculture	0.451	0.528	(-0.585, 1.486)	0.85	0.394	11.24

Regression Equation

Tiger = exp(Y')

Y' = -0.353 + 1.51 forest - 1.717 Urban + 0.451 Agriculture

Goodness-of-Fit Tests

Test	DF	Estimate	Mean	Chi-Square	P-Value
Deviance	15	40.26379	2.68425	40.26	0.000
Pearson	15	50.06253	3.33750	50.06	0.000

Fits and Diagnostics for Unusual Observations

Obs	Tiger	Fit	SE Fit	95% CI	Resid	Std Resid	Del Resid	HI	Cook's D
3	2.000	2.772	1.639	(0.870, 8.832)	-0.488	-2.77	-2.63	0.968890	53.83
6	6.000	1.276	0.400	(0.691, 2.357)	3.022	3.23	3.41	0.125149	0.72
12	3.000	0.625	0.393	(0.182, 2.146)	2.159	2.49	2.76	0.247483	0.99
14	5.000	1.121	0.536	(0.439, 2.864)	2.682	3.11	3.44	0.256594	1.56

```
Obs     DFITS
  3  -14.6734  R  X
  6    1.6913  R
 12    1.9856  R
 14    2.4957  R

R  Large residual
X  Unusual X
```

Results for: 2014.mtw

Poisson Regression Analysis: Tiger versus Forest, Urban, Agriculture

```
Method

Link function  Natural log
Rows used      19


Deviance Table

Source         DF  Seq Dev  Contribution  Adj Dev  Adj Mean  Chi-Square  P-Valu
e
Regression      3   35.301        58.22%   35.301    11.767       35.30    0.00
0
  Forest        1   13.776        22.72%    8.890     8.890        8.89    0.00
3
  Urban         1   19.558        32.26%   13.766    13.766       13.77    0.00
0
  Agriculture   1    1.967         3.24%    1.967     1.967        1.97    0.16
1
Error          15   25.334        41.78%   25.334     1.689
Total          18   60.635       100.00%


Model Summary

Deviance   Deviance
    R-Sq  R-Sq(adj)    AIC
  58.22%     53.27%  50.28


Coefficients

Term           Coef  SE Coef       95% CI       Z-Value  P-Value     VIF
Constant     -1.015    0.443  (-1.883, -0.147)    -2.29    0.022
Forest         3.23     1.39  (  0.52,   5.95)     2.33    0.020  137.61
Urban         -3.80     1.23  ( -6.20,  -1.40)    -3.10    0.002   94.85
Agriculture   0.832    0.532  (-0.211,  1.874)     1.56    0.118   13.68


Regression Equation

Tiger  =  exp(Y')


Y' = -1.015 + 3.23 Forest - 3.80 Urban + 0.832 Agriculture


Goodness-of-Fit Tests

Test      DF  Estimate     Mean  Chi-Square  P-Value
Deviance  15  25.33395  1.68893       25.33    0.046
Pearson   15  34.13389  2.27559       34.13    0.003
```

Fits and Diagnostics for Unusual Observations

Obs	Tiger	Fit	SE Fit	95% CI	Resid	Std Resid	Del Resid	HI	Cook's D
2	1.00	0.89	0.87	(0.13, 6.02)	0.11	0.28	0.28	0.847075	0.11
3	6.00	6.07	2.46	(2.74, 13.43)	-0.03	-0.44	-0.44	0.995861	11.46
6	7.00	1.31	0.38	(0.74, 2.33)	3.47	3.69	3.90	0.112131	0.88
14	5.00	6.50	2.41	(3.15, 13.43)	-0.61	-1.87	-1.80	0.891814	6.60

Obs	DFITS	
2	0.67014	X
3	-6.77032	X
6	1.87227	R
14	-5.13742	X

R Large residual
X Unusual X

Results for: 2015.mtw

Poisson Regression Analysis: Tiger versus Forest, Urban, Agriculture

Method

Link function	Natural log
Rows used	19

Deviance Table

Source	DF	Seq Dev	Contribution	Adj Dev	Adj Mean	Chi-Square	P-Value
Regression	3	43.373	67.79%	43.373	14.458	43.37	0.000
Forest	1	8.174	12.77%	5.941	5.941	5.94	0.015
Urban	1	2.227	3.48%	33.550	33.550	33.55	0.000
Agriculture	1	32.972	51.53%	32.972	32.972	32.97	0.000
Error	15	20.612	32.21%	20.612	1.374		
Total	18	63.985	100.00%				

Model Summary

Deviance R-Sq	Deviance R-Sq(adj)	AIC
67.79%	63.10%	47.12

Coefficients

Term	Coef	SE Coef	95% CI	Z-Value	P-Value	VIF
Constant	-1.347	0.510	(-2.348, -0.347)	-2.64	0.008	
Forest	1.544	0.661	(0.249, 2.838)	2.34	0.019	24.23
Urban	-7.49	1.53	(-10.50, -4.49)	-4.89	0.000	110.15
Agriculture	6.27	1.17	(3.97, 8.57)	5.34	0.000	61.02

Regression Equation

Tiger = exp(Y')

Y' = -1.347 + 1.544 Forest - 7.49 Urban + 6.27 Agriculture

Goodness-of-Fit Tests

Test	DF	Estimate	Mean	Chi-Square	P-Value
Deviance	15	20.61195	1.37413	20.61	0.150
Pearson	15	51.52504	3.43500	51.53	0.000

Fits and Diagnostics for Unusual Observations

Obs	Tiger	Fit	SE Fit	95% CI	Resid	Std Resid	Del Resid	HI	Cook's D
3	4.00	4.29	2.06	(1.68, 11.00)	-0.14	-1.33	-1.32	0.988380	37.01
6	3.00	0.49	0.20	(0.22, 1.08)	2.42	2.53	2.64	0.079576	0.30
14	11.00	9.14	2.91	(4.90, 17.05)	0.59	2.16	2.22	0.924061	15.10
15	1.00	1.26	0.92	(0.30, 5.24)	-0.24	-0.42	-0.41	0.666396	0.08
17	1.00	0.03	0.03	(0.00, 0.16)	2.28	2.31	2.44	0.022506	0.20

Obs	DFITS		
3	-12.1667		X
6	1.1015	R	
14	7.7707	R	X
15	-0.5714		X
17	0.8888	R	

R Large residual
X Unusual X

Results for: 2016.mtw

Poisson Regression Analysis: Tiger Mortal versus Forest (Sq.K, Agriculture , U rban (sq.km

Method

Link function	Natural log
Rows used	19

Deviance Table

Source	DF	Seq Dev	Contribution	Adj Dev	Adj Mean	Chi-Square	P-Value
Regression	3	78.428	60.75%	78.4277	26.1426	78.43	0.000
Forest (Sq.Km)	1	71.854	55.65%	0.0041	0.0041	0.00	0.949
Agriculture (sq.km)	1	2.146	1.66%	5.8040	5.8040	5.80	0.016

Urban (sq.km)	1	4.428	3.43%	4.4279	4.4279	4.43
0.035						
Error	15	50.682	39.25%	50.6817	3.3788	
Total	18	129.109	100.00%			

Model Summary

Deviance R-Sq	Deviance R-Sq(adj)	AIC
60.75%	58.42%	82.76

Coefficients

Term	Coef	SE Coef	95% CI	Z-Value	P-Value	VIF
Constant	0.233	0.231	(-0.220, 0.685)	1.01	0.314	
Forest (Sq.Km)	-0.036	0.555	(-1.123, 1.052)	-0.06	0.949	59.98
Agriculture (sq.km)	1.797	0.788	(0.252, 3.341)	2.28	0.023	106.15
Urban (sq.km)	-1.123	0.588	(-2.275, 0.030)	-1.91	0.056	52.68

Regression Equation

Tiger Mortality = exp(Y')

Y' = 0.233 - 0.036 Forest (Sq.Km) + 1.797 Agriculture (sq.km) - 1.123 Urban (sq.km)

Goodness-of-Fit Tests

Test	DF	Estimate	Mean	Chi-Square	P-Value
Deviance	15	50.68174	3.37878	50.68	0.000
Pearson	15	66.11540	4.40769	66.12	0.000

Fits and Diagnostics for Unusual Observations

Obs	Tiger Mortality	Fit	SE Fit	95% CI	Resid	Std Resid	Del Resid	HI
2	2.00	1.52	1.05	(0.40, 5.85)	0.37	0.69	0.72	0.717520
3	21.00	22.25	4.71	(14.70, 33.69)	-0.27	-4.08	-4.04	0.995659
6	7.00	1.00	0.33	(0.52, 1.90)	3.91	4.14	4.44	0.108368
10	0.00	2.02	0.47	(1.28, 3.20)	-2.01	-2.13	-2.07	0.111104
14	10.00	3.56	1.14	(1.90, 6.67)	2.79	3.50	3.81	0.365743

Obs	Cook's D	DFITS		
2	0.34	1.1609		X
3	934.81	-61.1494	R	X
6	1.23	2.2214	R	
10	0.07	-0.5332	R	
14	2.65	3.2532	R	

R Large residual
X Unusual X