

## Results and Interpretation

```
> colMeans(ns[, -1])
```

bodyweight	brainweight	slowwave	paradoxical	totalsleep	maxlifespan	gestation	predation	exposure	danger
103.199610	223.407805	8.746341	1.946341	10.692683	18.624390	132.426829	2.975610	2.365854	2.707317

Diagram-1 Mean of Variables

```
> cor_ns<-cor(ns[, -1])
> cor_ns
```

	bodyweight	brainweight	slowwave	paradoxical	totalsleep	maxlifespan	gestation	predation	exposure	danger
bodyweight	1.0000000	0.95578300	-0.3941619	-0.08528330	-0.3465452	0.49367227	0.71573071	0.09245552	0.4047933	0.25728773
brainweight	0.95578300	1.0000000	-0.3873854	-0.08540486	-0.3410456	0.65903040	0.73476282	-0.01984969	0.3221468	0.14823979
slowwave	-0.39416189	-0.38738544	1.0000000	0.52950836	0.9695681	-0.38190178	-0.61173576	-0.35520002	-0.5809034	-0.53675894
paradoxical	-0.08528330	-0.08540486	0.5295084	1.0000000	0.7210778	-0.22853106	-0.45035128	-0.43298042	-0.5243838	-0.60510120
totalsleep	-0.34654515	-0.34104555	0.9695681	0.72107779	1.0000000	-0.37787314	-0.62960793	-0.41506874	-0.6257914	-0.61303149
maxlifespan	0.49367227	0.65903040	-0.3819018	-0.22853106	-0.3778731	1.0000000	0.70230358	-0.15001747	0.3344946	0.03458641
gestation	0.71573071	0.73476282	-0.6117358	-0.45035128	-0.6296079	0.70230358	1.0000000	0.07874121	0.5737789	0.29963383
predation	0.09245552	-0.01984969	-0.3552000	-0.43298042	-0.4150687	-0.15001747	0.07874121	1.0000000	0.6256616	0.92702110
exposure	0.40479331	0.32214676	-0.5809034	-0.52438384	-0.6257914	0.33449461	0.57377890	0.62566164	1.0000000	0.78988460
danger	0.25728773	0.14823979	-0.5367589	-0.60510120	-0.6130315	0.03458641	0.29963383	0.92702110	0.7898846	1.0000000

Diagram-2 Correlation of Variables

From the Diagram-2, bodyweight and brain-weight are highly positive correlated, and slow-wave sleep is highly associated with total sleep, which demonstrated slow-wave sleep takes the most part of the total sleep time. All ecological variables are negatively associated with sleep.

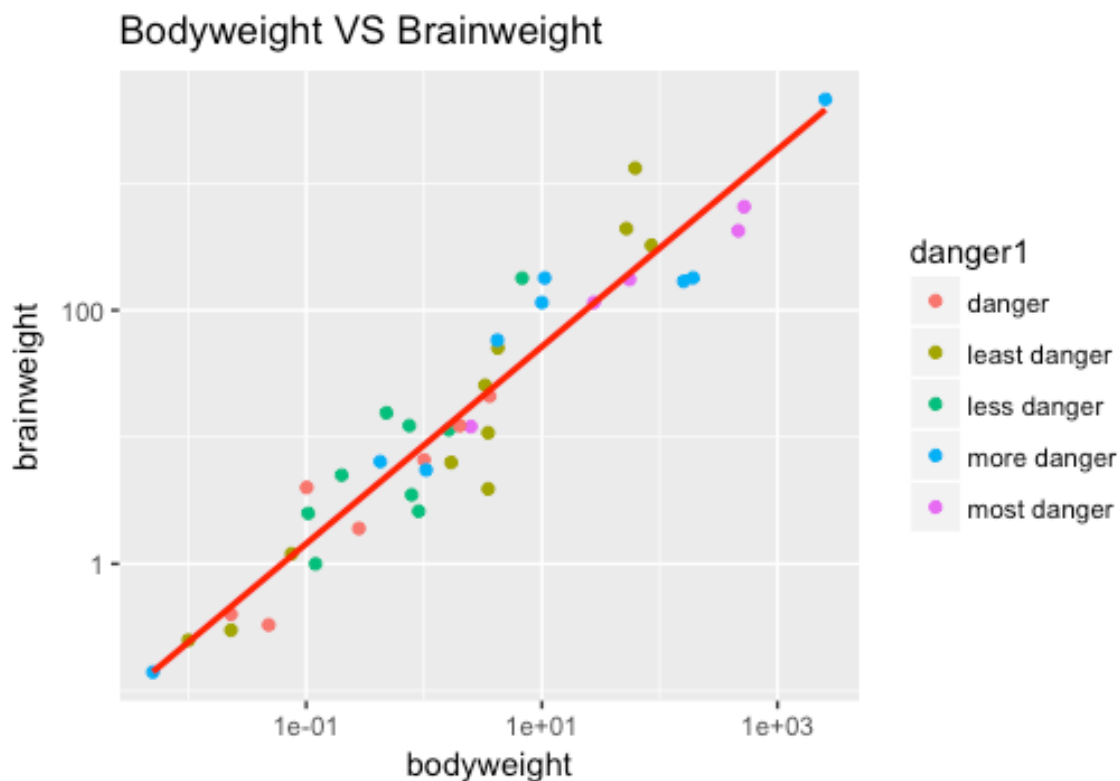


Diagram-3

Diagram-3 shows the positive linear relationship between bodyweight and brain-weight in different overall danger index. From the distribution, the bodyweight and brain-weight do not have clear relationship with danger index.

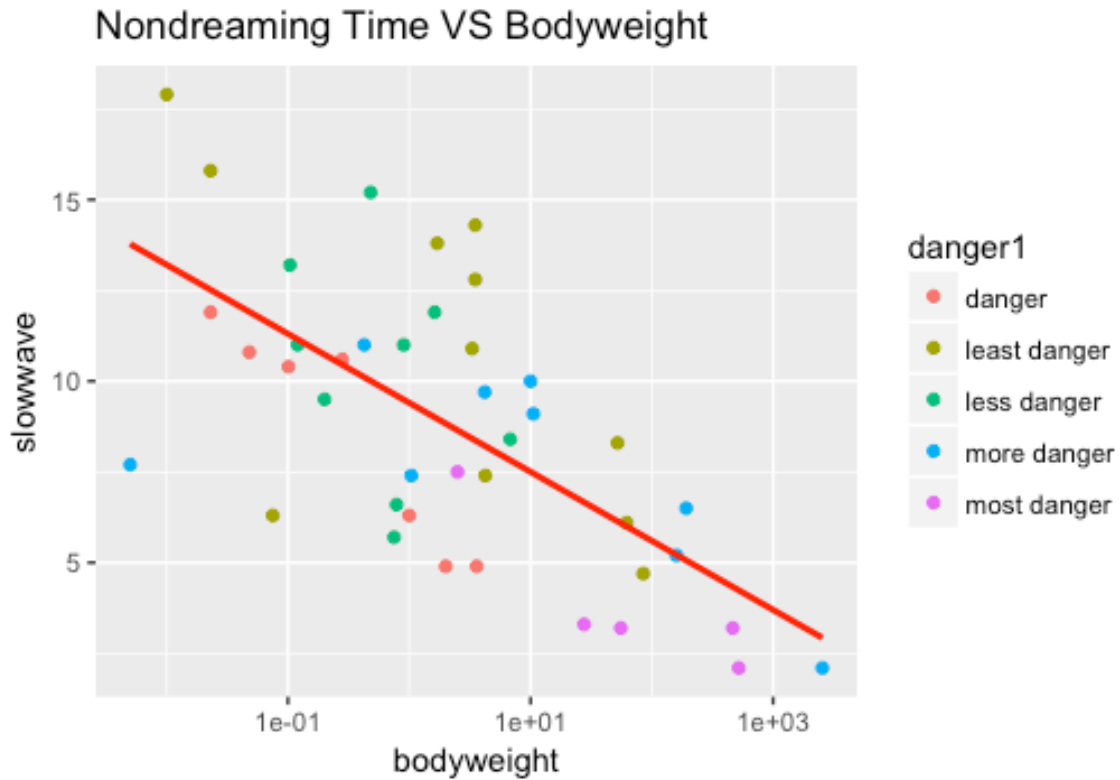


Diagram-4

Diagram-4 shows the negative relationship between slow-wave sleep and mammals' bodyweight, and mammals in high danger won't have too light bodyweight.

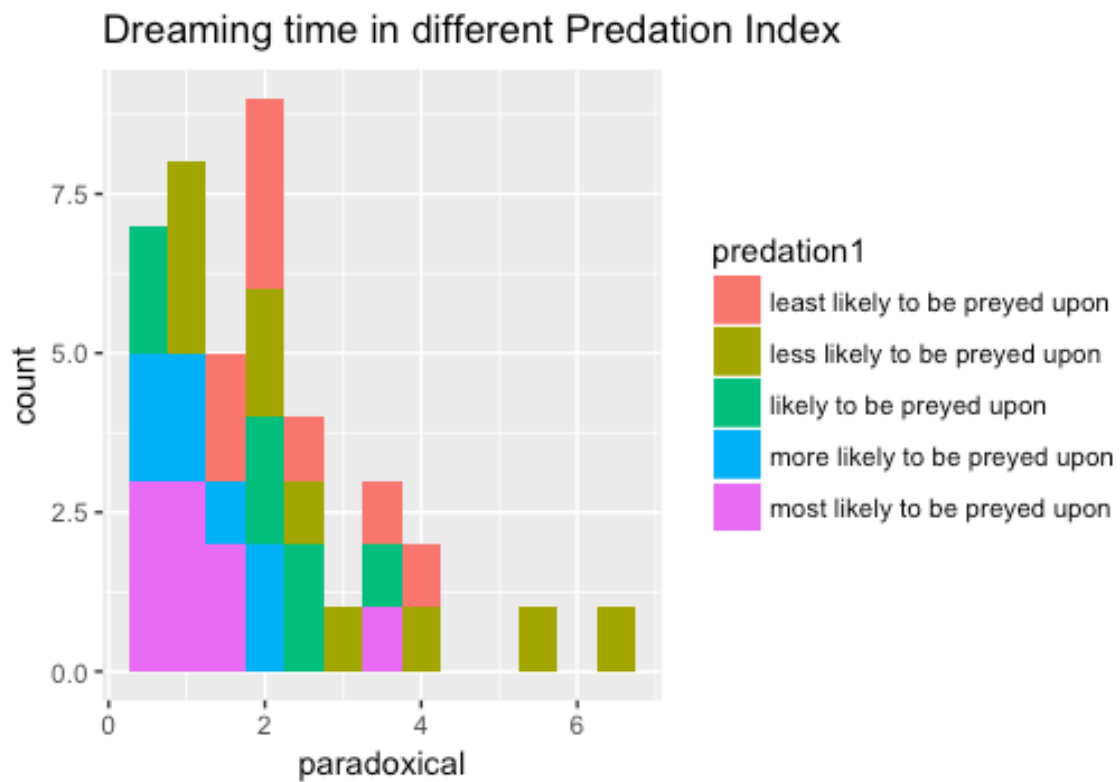


Diagram-5

In Diagram-5, mammals which are most likely to be preyed upon have less paradoxical sleep than others. The duration of sleep mostly ranges from 0 to 2 hours per day, and only less likely to be preyed upon mammals have over five hours sleep per day.

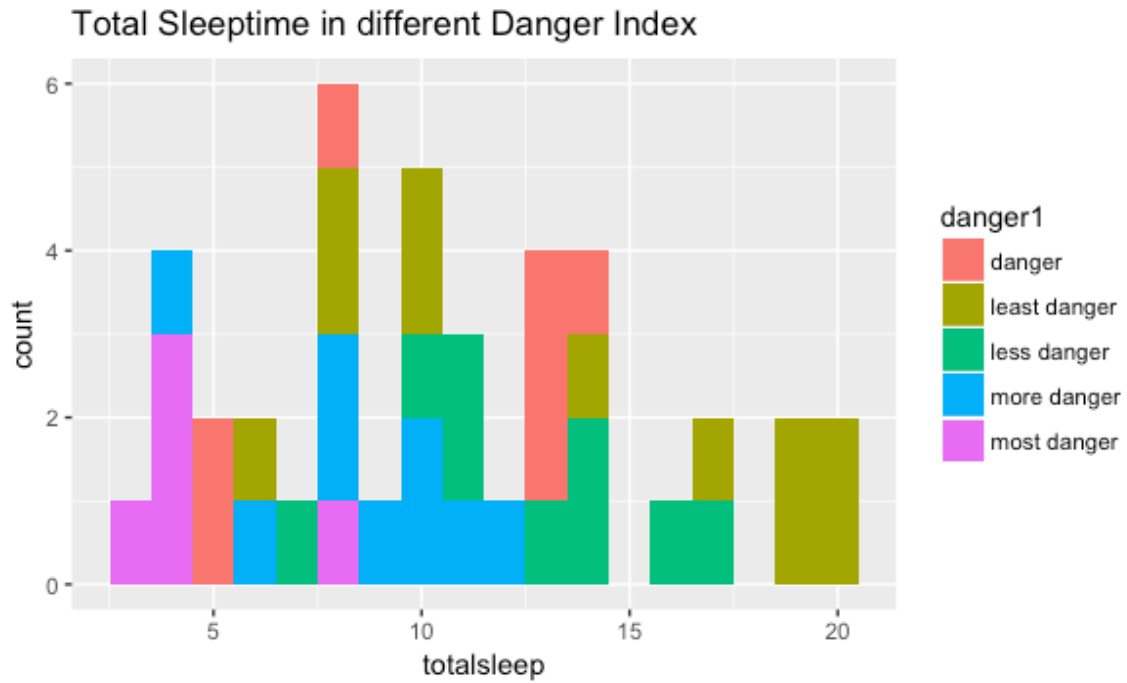


Diagram-6

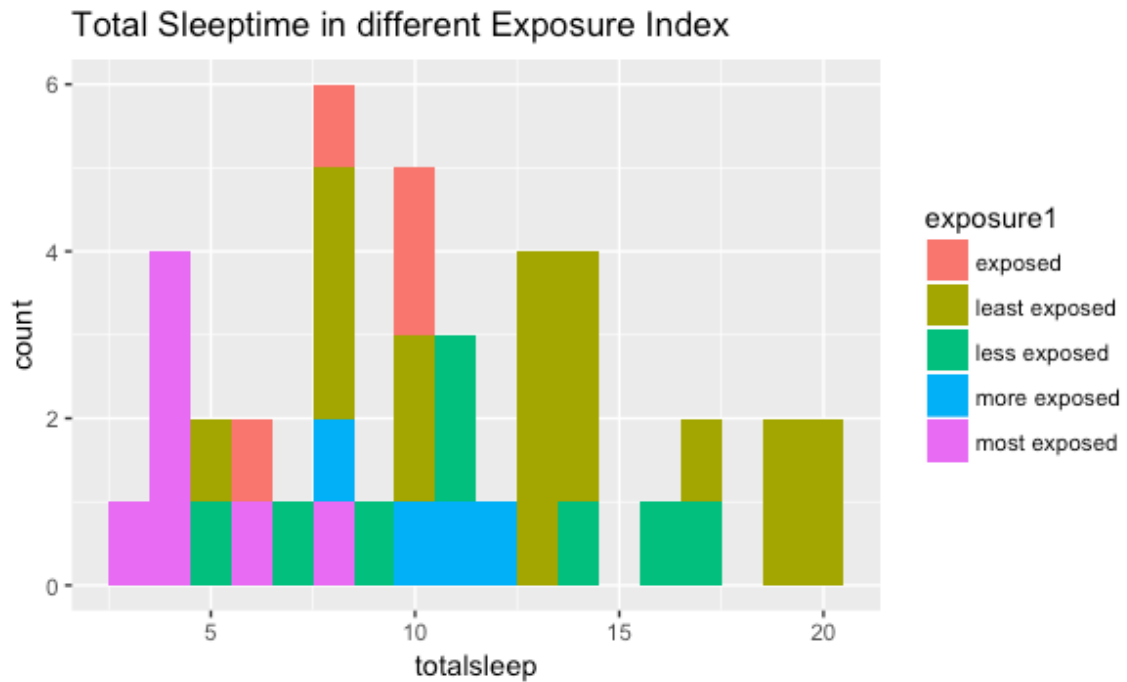


Diagram-7

From Diagram-6 and Diagram-7, mammals in dangerous environment and not sleeps in a

well-protected den have the less total sleep hours than mammals in less dangerous environment and sleeps in well-protected den, but the total sleep time do not have clear relationship with danger and exposure index.

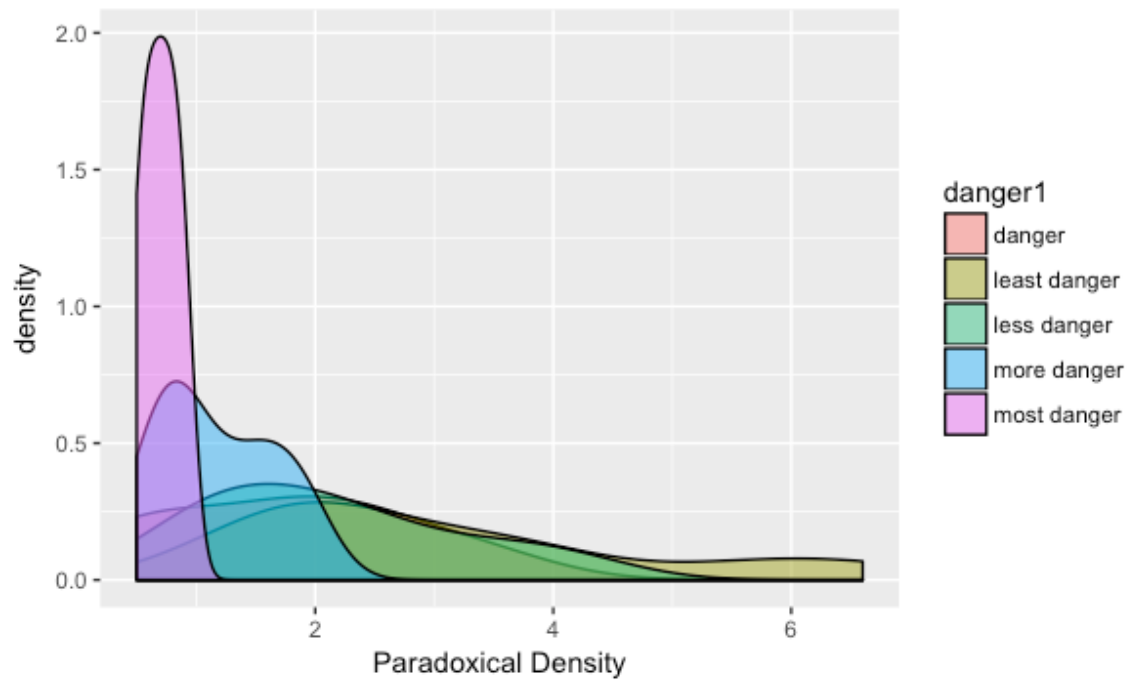


Diagram-8

Diagram-8 shows the density distribution of paradoxical sleep in different danger index, and it illustrated that mammals in most and more dangerous environment have less paradoxical sleep.