# Population Model Parameters

## Adult survival

2 Coxph analyses on a monthly scale based on the daily mortality data I used in my mortality analysis.

1. Looked at pack size and temperature effects (as well as dispersing vs resident – I took the values for resident)
2. Looked at the effect of being an alpha vs non-alpha. For this I removed the dogs that were never alpha from the dataset to examine how alpha status changed mortality of individual dogs.

Function: ad\_surv2 <- function(temp,size,a,b,c){

u = a+b\*temp+c\*size

u = exp(u)

u = u/(1+u)

return(u)}

Values:

|  |  |  |
| --- | --- | --- |
| Variable | Value | Additional notes |
| Intercept (base hazard) | 0.0002516054 |  |
| Pack size (n adults) | 0.08270 | This is multiplied by 2 in mine because it’s single sex to give 0.1654 |
| Temperature (monthly) | -0.17019 |  |
| Alpha | 5.149% more likely to die each month | Instead of this being included in the function this is just subtracted from the adult survival rate each turn. |

## Juvenile survival

Binomial glm with maximum temperature (monthly) and number of littermates as predictors – this is from the survival to 1 year data from the hot dogs paper

Function: juv\_surv<-function(temp,pups,a,b,c){

u = a+b\*temp+c\*pups

u = exp(u)

u = u/(1+u)

u = nthroot(u,9)

return(u)}

|  |  |  |
| --- | --- | --- |
| Variable | Value | Additional notes |
| Intercept | 18.61131 |  |
| Pup number (n littermates) | 0.27410 | This is multiplied by 2 in mine because it’s single sex to give 0.5482 |
| Temperature (monthly) | -0.70572 |  |

## Pup number

Poisson glm with maximum temperature pack number as predictor – this is from the data on pup numbers from the hot dogs paper

Function: pup\_no<-function(size,a,b){

u<-exp(a+b\*size)

return(u)}

|  |  |  |
| --- | --- | --- |
| Variable | Value | Additional notes |
| Intercept | 1.7503 |  |
| Pack size (n adults) | 0.02287 | This is multiplied by 2 in mine because it’s single sex to give 0.04574 |

## Inter Birth Interval

Binomial glm with maximum temperature (3 months prior to emergence) and previous litter size as predictors - this is from the data on birth timings which I think is in the Tico paper?

Function: IBI\_func<-function(pups,temp,a,b,c){

u<-(a+b\*pups+c\*temp)

return(u)}

|  |  |  |
| --- | --- | --- |
| Variable | Value | Additional notes |
| Intercept | -17.35578 |  |
| Litter size (previous) | 0.25988 | This is multiplied by 2 in mine because it’s single sex to give 0.51976 |
| Temperature (3 months) | 0.91565 |  |

## Dispersal

Coxph analysis on a monthly scale based on the daily dispersal data I used in my mortality analysis and the dispersal paper stuff.

Function: ad\_disp2<-function(size,a,b){

u = a+b\*size

u = exp(u)

u = u/(1+u)

return(u)}

|  |  |  |
| --- | --- | --- |
| Variable | Value | Additional notes |
| Intercept (base hazard) | 0.0006426239 |  |
| Pack size (n adults) | 0.10594 | This is multiplied by 2 in mine because it’s single sex to give 0.21188 |