**Effects of different variables at different horizons**

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| --- | --- | --- | --- | --- |
| **Variable** | **PB female** | | | |
|  | **control** | **control** | **exclosure** | **exclosure** |
|  | **60 (2 month)** | **90 (3 months)** | **60 (2 month)** | **90 (3 months)** |
| NDVI (lag 0) | -0.21 | -0.45 | **-0.66** | **-0.56** |
| NDVI (lag 1) | 0.15 | 0.15 | **0.72** | **0.57** |
| Mean\_temp(lag 0) | -1.52 | -0.86 | -1.41 | -1.22 |
| Mean\_temp (lag 1) | 2.28 | 2.20 | -0.94 | -1.00 |
| Warm\_precip (lag 0) | 0.70 | **1.93** | **1.37** | **1.50** |
| Warm\_precip (lag 1) | **1.61** | 0.67 | 0.15 | 0.12 |
| Cool\_precip (lag 0) | **-1.98** | -0.11 | -0.56 | -0.16 |
| Cool\_precip (lag 1) | **1.97** | **1.84** | 0.64 | 0.61 |
| PP biomass | -0.16 | 0.05 | **1.14** | **1.08** |
| PB biomass | 0.14 | -0.17 | -0.02 | -0.08 |
| *Dipodomys* biomass | 0.12 | 0.33 | 2.28 | 2.13 |
| *Deviance explained* | *71.2%* | *70.9%* | *71.8%* | *71.6%* |

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| --- | --- | --- | --- | --- |
| **Variable** | **PP female** | | | |
|  | **control** | **control** | **exclosure** | **exclosure** |
|  | **60 (2 month)** | **90 (3 months)** | **60 (2 month)** | **90 (3 months)** |
| NDVI (lag 0) | 0.20 | 0.20 | -0.24 | -0.19 |
| NDVI (lag 1) | 0.31 | 0.10 | **0.55** | **0.43** |
| Mean\_temp(lag 0) | **2.98** | **3.35** | **2.91** | **3.05** |
| Mean\_temp (lag 1) | 0.43 | -0.19 | **2.25** | **2.18** |
| Warm\_precip (lag 0) | **1.08** | **1.61** | **1.51** | **1.89** |
| Warm\_precip (lag 1) | 0.29 | 0.26 | -0.28 | -0.64 |
| Cool\_precip (lag 0) | **-3.28** | **-2.54** | 0.19 | -0.17 |
| Cool\_precip (lag 1) | 0.20 | **1.46** | 0.17 | 0.43 |
| PP biomass | **0.52** | **0.52** | **0.48** | **0.47** |
| PB biomass | **-0.60** | **-0.75** | **-0.65** | **-0.69** |
| *Dipodomys* biomass | -0.31 | -0.22 | 1.09 | 0.75 |
| *Deviance explained* | *56.8%* | *57%* | *52.7%* | *53.3%* |

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| --- | --- | --- | --- | --- |
| **Variable** | **PB male** | | | |
|  | **control** | **control** | **exclosure** | **exclosure** |
|  | **60 (2 month)** | **90 (3 months)** | **60 (2 month)** | **90 (3 months)** |
| NDVI (lag 0) | -0.09 | -0.05 | -0.23 | -0.18 |
| NDVI (lag 1) | 0.00 | -0.04 | 0.24 | 0.23 |
| Mean\_temp(lag 0) | 0.54 | 0.65 | -0.23 | -0.32 |
| Mean\_temp (lag 1) | **-1.71** | **-1.84** | 0.17 | -0.15 |
| Warm\_precip (lag 0) | 0.26 | 0.33 | **0.79** | **1.04** |
| Warm\_precip (lag 1) | 0.07 | 0.01 | -0.06 | -0.48 |
| Cool\_precip (lag 0) | -0.00 | 0.06 | 0.46 | 0.90 |
| Cool\_precip (lag 1) | 0.07 | -0.06 | 0.25 | -0.53 |
| PP biomass | **0.84** | **0.83** | **0.95** | **0.99** |
| PB biomass | **-0.67** | **-0.65** | **-0.48** | **-0.50** |
| *Dipodomys* biomass | *-0.01* | -0.01 | 1.60 | 1.77 |
| *Deviance explained* | *21.6%* | *21.7%* | *43.7%* | *43.7%* |

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| --- | --- | --- | --- | --- |
| **Variable** | **PP male** | | | |
|  | **control** | **control** | **exclosure** | **exclosure** |
|  | **60 (2 month)** | **90 (3 months)** | **60 (2 month)** | **90 (3 months)** |
| NDVI (lag 0) | 0.31 | 0.33 | -0.06 | -0.05 |
| NDVI (lag 1) | -0.03 | -0.03 | 0.21 | 0.30 |
| Mean\_temp(lag 0) | -0.26 | -0.27 | 0.51 | 0.26 |
| Mean\_temp (lag 1) | -1.22 | -1.22 | -0.62 | -0.63 |
| Warm\_precip (lag 0) | 0.43 | 0.74 | 0.57 | 0.82 |
| Warm\_precip (lag 1) | 0.08 | -0.28 | -1.19 | **-2.03** |
| Cool\_precip (lag 0) | -0.22 | -0.32 | 0.07 | 0.34 |
| Cool\_precip (lag 1) | -0.18 | -0.10 | 0.14 | -0.24 |
| PP biomass | -0.02 | -0.06 | -0.13 | -0.11 |
| PB biomass | 0.25 | 0.28 | 0.01 | 0.01 |
| *Dipodomys* biomass | **0.25** | 0.24 | -0.09 | -0.10 |
| *Deviance explained* | *63.1%* | *63.3%* | *50.5%* | *51.8%* |

NOTES:

1. It seems like setting the horizon at either 2 or 3 months (60/90 days) gives somewhat similar results model performance wise (i.e., % deviance explained is about the same with only ~.2-2% difference if horizon is set at 2or 3 months. Does this mean we could use either? Or should we choose one that makes more biological sense for the system (i.e., how long do plants germinate or something? if we are thinking of precip as an indirect cue related to primary productivity then reproduction?)
2. It also seems like using either 2- or 3-months horizon is okay since the variables that are considered “significant” in PB males, PB and PP females in exclosures are the same. Not sure if that is super important.
3. Do we interpret the negative effect of NDVI at lag 0 but positive at lag 1 as, if an individual is reproductive the month before, then even if NDVI is currently, they wouldn’t necessarily be exhibiting reproductive traits?
4. Does the positive effect of k-rats in control set-up for PP males just mean that if it’s like really good conditions, they don’t really care about competition or something? (Same as PB males being positively liked to PP biomass no matter the biotic context) Or is it because PPs are not really bothered by k-rats but more by PBs?
5. What does a positive effect of cool\_precip at lag 1 mean?
6. From that Australian paper (<https://doi.org/10.1071/WR9940569>), which was super useful, they used an index for precip called cumulative monthly rain residual (CMRR), which is the cumulative difference between the actual mean and monthly rainfall over the sampling period. The author wrote this as a rationale behind the index: “Numbers of rodent individuals captured on the two trap plots, in any given month, were correlated with the CMRR in the same month, and also with the CMRR in every previous month up to one year earlier. In this manner any time-lag in the response of the rodent populations to rainfall could be detected.” Would it be applicable to Portal as well? Should we explore this index/add it as a covariate in portalr?