Merced River Redd Site Selection (19 February 2019)

**General Goals**

The main goal is to perform a logistic regression investigating redd presence (redd=1) and absence (redd=0). Potential parameters include depth, velocity, csi, wsg, dar, for each site individually and pooled together. The steps include generating a candidate set of models, run AIC, and calculate additional statistics as needed. This analysis is similar to Benjankar et al., (2016). The GIT repository can be found here <https://github.com/RMBond/Merced_Redd_selection.git>

**Description of Datasets:**

The input file “mHabVarsSite.csv” was generated by L. Harrison on 14 February 2019. The script “Redd\_logisticregression.R” was created to run the logistic regression model generation and AIC ranking. Output csv files can be found under the data folder.

**Output**:

All Data (pooled, no site code)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Model | Params | logL | AICc | Δ AICc | weight | cumwt |
| **Depth** | 2 | -148.806 | 301.6593 | **0** | 0.9591 | 0.9591 |
| CSI | 2 | -152.773 | 309.5931 | 7.9338 | 0.0182 | 0.9772 |
| CSI+WSG+CSI\*WSG | 4 | -151.132 | 310.4253 | 8.7661 | 0.012 | 0.9892 |
| DAR + CSI | 3 | -152.27 | 310.6365 | 8.9773 | 0.0108 | 1 |
| Velocity | 2 | -162.072 | 328.1922 | 26.5329 | 0 | 1 |
| DAR + WSG | 3 | -167.259 | 340.614 | 38.9547 | 0 | 1 |
| null | 1 | -174.673 | 351.3622 | 49.7029 | 0 | 1 |
| WSG | 2 | -173.676 | 351.3998 | 49.7406 | 0 | 1 |
| DAR | 2 | -174.513 | 353.0743 | 51.4151 | 0 | 1 |

All Data (coded including site)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Model | Params | logL | AICc | Δ AICc | weight | cumwt |
| **CSI + site** | 3 | -146.668 | 299.4334 | **0** | 0.3952 | 0.3952 |
| **CSI+WSG+CSI\*WSG + site** | 5 | -145.048 | 300.3403 | **0.9069** | 0.2511 | 0.6462 |
| **Depth + site** | 3 | -147.362 | 300.8201 | **1.3868** | 0.1975 | 0.8438 |
| **DAR + CSI + site** | 4 | -146.588 | 301.3377 | **1.9044** | 0.1525 | 0.9963 |
| Velocity + site | 3 | -151.329 | 308.754 | 9.3206 | 0.0037 | 1 |
| DAR + WSG + site | 4 | -160.948 | 330.0576 | 30.6242 | 0 | 1 |
| Site (null equivalent) | 2 | -174.673 | 353.3944 | 53.961 | 0 | 1 |
| WSG + site | 3 | -173.675 | 353.4472 | 54.0139 | 0 | 1 |
| DAR + site | 3 | -174.508 | 355.112 | 55.6787 | 0 | 1 |

Note: will need to model average

Robinson data

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Model | Params | logL | AICc | deltaAICc | weight | cumwt |
| **CSI+WSG+CSI\*WSG** | 4 | -54.9114 | 118.1147 | **0** | 0.5127 | 0.5127 |
| **DAR + CSI** | 3 | -56.0492 | 118.2723 | **0.1575** | 0.4739 | 0.9866 |
| Velocity | 2 | -61.0853 | 126.2569 | 8.1421 | 0.0087 | 0.9953 |
| WSG | 2 | -62.587 | 129.2604 | 11.1457 | 0.0019 | 0.9973 |
| DAR | 2 | -62.7656 | 129.6175 | 11.5028 | 0.0016 | 0.9989 |
| DAR + WSG | 3 | -62.1224 | 130.4186 | 12.3039 | 0.0011 | 1 |
| Depth | 2 | -71.1216 | 146.3295 | 28.2147 | 0 | 1 |
| CSI | 2 | -73.9626 | 152.0115 | 33.8968 | 0 | 1 |
| null | 1 | -76.2462 | 154.521 | 36.4062 | 0 | 1 |

Note: will need to model average

Merced River Ranch data

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Model | Params | logL | AICc | deltaAICc | weight | cumwt |
| **CSI+WSG+CSI\*WSG** | 4 | -66.4325 | 141.1569 | **0** | 0.7857 | 0.7857 |
| CSI | 2 | -70.1406 | 144.3675 | 3.2105 | 0.1578 | 0.9435 |
| DAR + CSI | 3 | -70.1307 | 146.4353 | 5.2784 | 0.0561 | 0.9996 |
| Depth | 2 | -76.2136 | 156.5136 | 15.3567 | 0 | 1 |
| Velocity | 2 | -89.3888 | 182.8639 | 41.707 | 0 | 1 |
| null | 1 | -98.4269 | 198.8824 | 57.7254 | 0 | 1 |
| dar | 2 | -98.3487 | 200.7838 | 59.6268 | 0 | 1 |
| WSG | 2 | -98.3492 | 200.7847 | 59.6278 | 0 | 1 |
| DAR + WSG | 3 | -97.8345 | 201.8429 | 60.6859 | 0 | 1 |

**Next To Do's**

1. Other candidate models? Interactions?

2. Additional statistics? (Wald statistic?)