**Example\_1\_Analysis Files**

This folder includes the processed dataset, stan models, and R code necessary to perform the analysis for Example 1.

*ex1.Rda*

This file contains the process dataset. Each row relates to a unique transect. There are 6290 transect. The columns are described below:

* *litter*: the percent herbaceous litter cover for each transect.
* *shrub*: the percent shrub species cover for each transect.
* *region*: the region the transect is located in. These are presented as numbers so they can be accounted for in the Stan model. Region 1 refers to the Elko District Office in Nevada, Region 2 refers to the Taos Field Office in New Mexico, and Region 3 refers to the Northwest District Office in Colorado.
* *plot*: the unique plot each transect is within. Each plot is presented as numbers so they can be accounted for in the Stan model. There are 2101 different plots.
* *obs*: the observer who collected cover data at each transect. Each observer is presented as numbers to they can accounted for in the Stan model. There are 143 different observers.

*ex1\_mixed\_effects.stan*

This file contains the stan model for the mixed-effects model. See the comments within the code for more details on the model.

*ex1\_mixed\_effects\_analysis.R*

This file contains the R code to run the mixed-effects analysis. It includes the necessary packages, further data set up and formatting, uploading and fitting the stan model which draws samples of the posterior distribution, and basic summary and graphics for the sample posterior distributions of the mixed-effects model parameters. See comments within the Rscript for more details.

*ex1\_heterogeneous\_variance\_mixed\_effects.stan*

This file contains the stan model for the heterogeneous-variance mixed-effects model. See the comments within the code for more details on the model.

*ex1\_heterogeneous\_variance\_mixed\_effects\_analysis.R*

This file contains the R code to run the heterogeneous-variance mixed-effects analysis. It includes the necessary packages, further data set up and formatting, uploading and fitting the stan model which draws samples of the posterior distribution, and basic summary and graphics for the sample posterior distributions of the heterogeneous-variance mixed-effects model parameters. See comments within the Rscript for more details.