While this model looks larger and more complicated that most we've looked at in BUGS, it really just consists of a number of simple parts we've seen before. The first part is the fitting of the calibration curve. The second part involves using the calibration curve to estimate soil moisture and then fitting the Poisson regression of seedling density vs soil moisture. The third part is just calculating the model credible interval and predictive interval over a sequence of soil moisture values (SMseq). Unlike the conventional approach of performing each step sequentially, this approach propagates the error in each step into the final model. Reminder: you may want to specify initial conditions on the model parameters. It is perfectly valid to use the previous estimates (e.g. Task 1) for the initial conditions. For example, if I wanted to initialize alpha to all 0's and sigma to 5 I would specify list(alpha=c(0,0),sigma(5))

Lab Report Task 5:

14. Fit the final combined calibration/Poisson regression model and provide a summary table and posterior density plots for the model parameters. Also report the number of chains, length of each chain, burn in, thin, and the resultant MCMC sample size used to estimate the parameters.
15. Use the Comparison Tool to plot the model credible interval and predictive interval. For this particular case the scatterplot of the observed data is NOT required as this is not straightforward in BUGS and would require outputting the posterior to other software (e.g. R) in order to make the graph.
16. How does this fit compare to the previous Poisson regression of seedlings vs TDR in terms of the overall uncertainty in the model (width of credible and predictive intervals)? In qualitative terms, to what degree does ignoring the uncertainty in the TDR/Soil Moisture relationship affect the uncertainty in our parameter estimates and our confidence in our model?