**ReadMe for “Habitat temperature parameters.R”**

The following ReadMe gives a brief overview of how to use “Habitat temperature parameters.R”. ***Please note that running this script is not strictly necessary for the populations in the manuscript as all habitat temperature parameters already exist in “Habitat temperature parameters.csv” in the “Model Parameters” folder.*** Also, please note that the nonlinear least squares regression function *nls* in R must be given a ‘start’ list of rough parameter estimates. To do this efficiently, this script uses the parameter estimates in “Habitat temperature parameters.csv” in the ‘start’ list of *nls*, which is a circular method for parameter estimation. All parameters, however, were initially estimated by providing rough estimates in the ‘start’ list of *nls*, and can thus be estimated *a priori* by ‘seeding’ each parameter column in “Habitat temperature parameters.csv” with a rough estimate of each parameter.

**Input:** User-defined location for climate data or *all* = TRUE

**Output:** Updated “Habitat temperature parameters.csv” file (if *save* = TRUE) or print out (if *save* = FALSE) with the habitat temperature parameters for either a specified population (if *all* = FALSE) or all populations (if *all* = FALSE)

**To run:**

1. Update variable *location* (line 12) with location name from “Habitat temperature parameters.csv” (if a new population is added, please add relevant information to a new line in “Habitat temperature parameters.csv” and then ‘seed’ the parameter columns by adding a rough estimate of each parameter (used for the “start” list in nls in order to estimate parameters via nonlinear regression). Set *all* = TRUE if the script is to be run for all locations in “Habitat temperature parameters.csv” or set *all* = FALSE if the script is to be run just for the specified location.
2. To save parameter fits (over existing values in “Habitat temperature parameters.csv”), change *save* from FALSE to TRUE in line 16
3. Run the script

**Potential issues:**

* The script only works if the working directory (see line 9) is in the main folder of the downloaded GitHub repo
* The variable *location* (line 12) must exist within “Habitat temperature parameters.csv” and match the “Location” column exactly
* Some modifications to the “start” list in *nls* (lines 63, 66) may be needed for new populations not in “Habitat temperature parameters.csv”

**Script details:**

Lines 5-9 Install required packages and set working directory

Lines 11-16 Have user enter required information

Lines 18-44 Read in, and then find selected population in, “Habitat temperature parameters.csv”

Lines 46-58 Quantify daily mean temperatures from climate data for recent and future period

Lines 60-71 Fit habitat parameters via *nls* and assess whether climate change parameters should be set to zero in the future (see manuscript)

Lines 73-85 Assign model parameters and end *for* loop

Lines 87-94 Save model parameters (if desired) or print model fits for a specified species