Building Species Lists

Scope

This document describes the method used to develop a species list for planting a little forest. We discuss how to select species for your forest, and how to use our Species List Template Google Sheet to determine how many of each species to plant based on the size of the planting area and the desired percentages of species in each forest layer (canopy, tree, understory, shrub).

Forest Layers

Typically, we plant little forests using Akira Miyawaki's suggested proportions for each layer, as follows:

Layer	**Height**	**Percentage**
Canopy	25m+	20%
Tree	15-25m	40-50%
Understory Tree	5-15m	25-30%
Shrub	<5m	8-12%

Note that the layer percentages refer to the overall number of plants in a layer, not the number of species

There could be special circumstances where we target different layer percentages. For example if we wanted a forest that was overall shorter in height, we might focus more on understory trees and shrubs. But for a typical little forest, these are the percentages we go for.

Species Distribution

-5 **Dominant Species** make up 40-50% of total saplings.
-**Supporting Species** make up 25-40% of total saplings.
-**Rare Species** make up the rest.

Choosing Appropriate Species

It is important to, as best we can, choose species that will thrive in community with one another and in the location they will be planted. Understanding site conditions helps us do this. A site might be naturally wetter or drier, more or less exposed, and have certain soil characteristics (eg shallow, clay, sand, etc.).

Also, we might have certain desired traits of the forest, for example species that provide food, medicine, pollinator support etc. We are also increasingly interested in survival ecology and planting forests that will be climate-change resilient and help mitigate climate change in various ways.

Once you have a good idea of what the site conditions are and what types of species you might be interested in planting, you can choose species that are appropriate for your forest.

In order to help with this, we've developed a spreadsheet that has a list of species that can be good choices for our area, along with useful information about each of these species. This spreadsheet can be found here: Forest Builder Google Sheet

We also have a document outlining how to use the Forest Builder Google Sheet. It can be found here: Using the Forest Builder Sheet

The Species List Google Sheet

We have developed a Google Sheet that we use to build lists of species for planting. As we input some information about our site and the percentages of each species we would like to see in the forest, the sheet calculates:

- How many trees to plant in a given area
- How many of each plant to order, and
- The percentages of plants in each layer

So as we add species to our list, we can see how these plants affect our layer breakdown and can adjust accordingly until our layer percentages fall within their appropriate ranges.

A blank Species List Template can be found here.
Note: You will have to save a copy of the blank species list to your own Google Drive in order to use it, as the version on our Drive is read-only. Once you make a copy, you'll be able to edit the sheet.

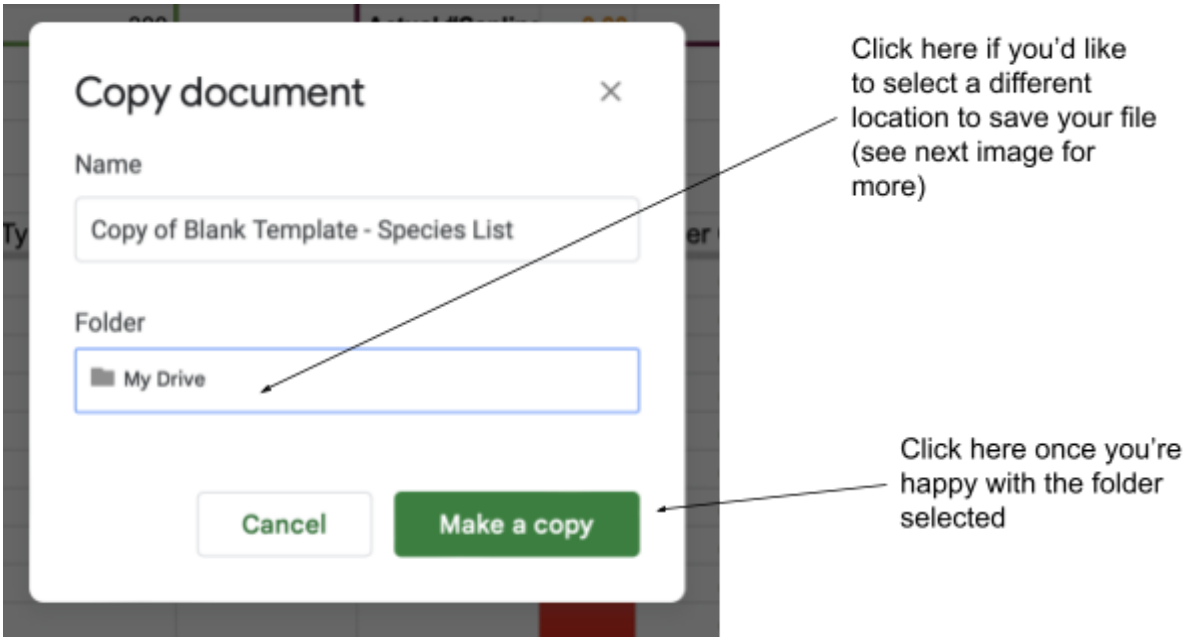
Making a Copy so you can edit the Sheet

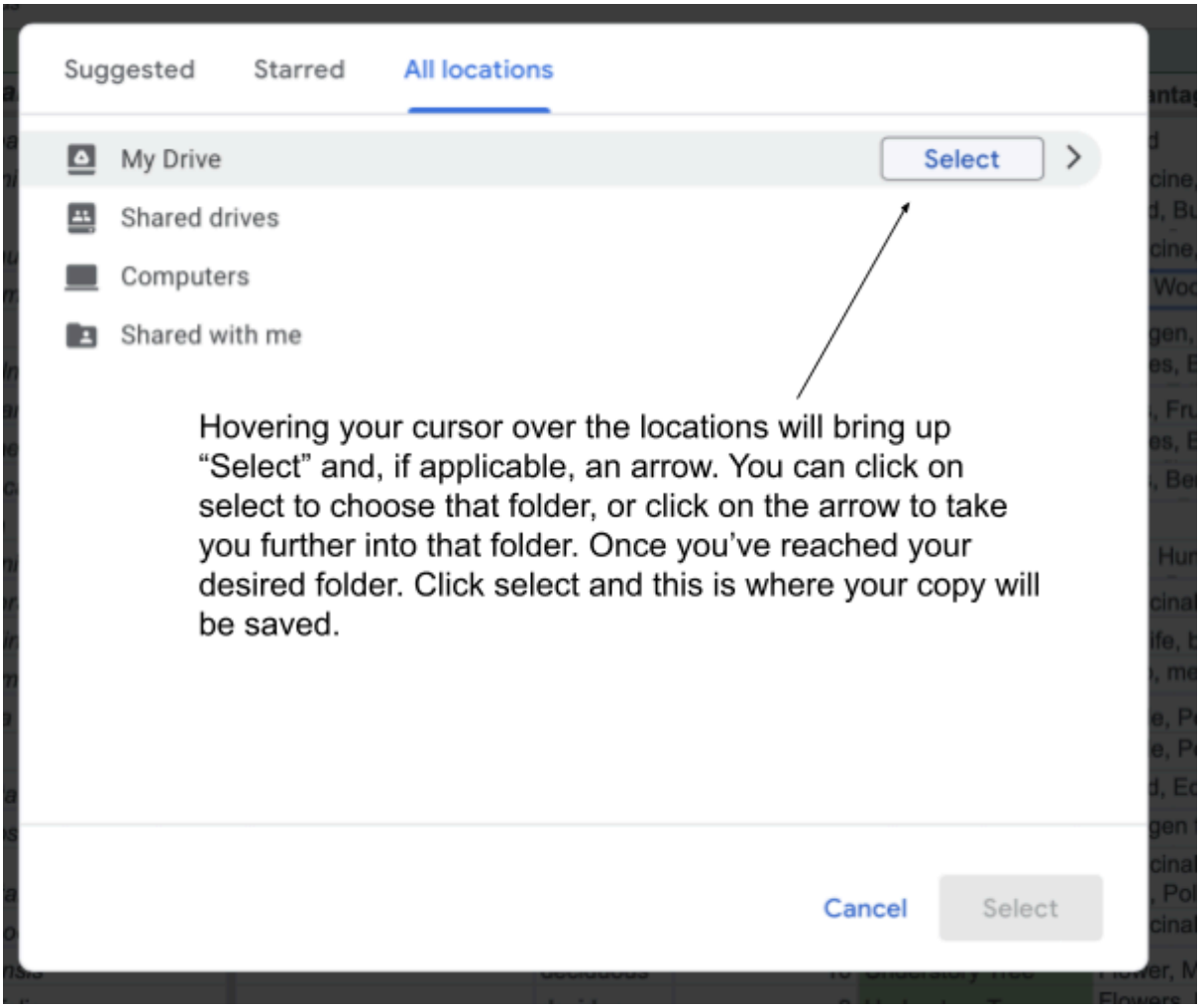
- If you'd like to be able to use the template, you can do so by either:
    - Downloading a copy to Excel and saving to your computer.
    - Making a copy of the sheet in your own Google Drive.

1. Downloading a Copy in Excel
    a. Click on **File > Download > Microsoft Excel (.xlxs)**. A copy will be downloaded to your downloads folder

2. Making a copy of the sheet in your own Google Drive:

    Click on **File > Make a copy**. Follow the instructions in the following images if you're not sure of how to make a copy in your own drive.





Explanation of the Species List Google Sheet (SLGS)

Instructions Worksheet:

There is a worksheet within the SLGS that gives basic instructions on how to build your species list that can be referred to for guidance.

Forest Worksheet:

This is the worksheet where you will enter your species list. The remainder of this section will detail how to build a species list in your Forest Worksheet.

The default name of the Forest Worksheet is "Forest 1." You can rename this worksheet, and can also duplicate it if you'd like to have more than one Species List in your file.

It is important to note that there are only a few cells and columns where you need to input information into the SLGS. Many cells and columns populate automatically and

typing into these cells/columns can interfere with formulas and calculations and result in your species list not populating properly.

Inputs: These are cells and columns that you need to enter info into:

Cell C2/C3: Planting area and density.

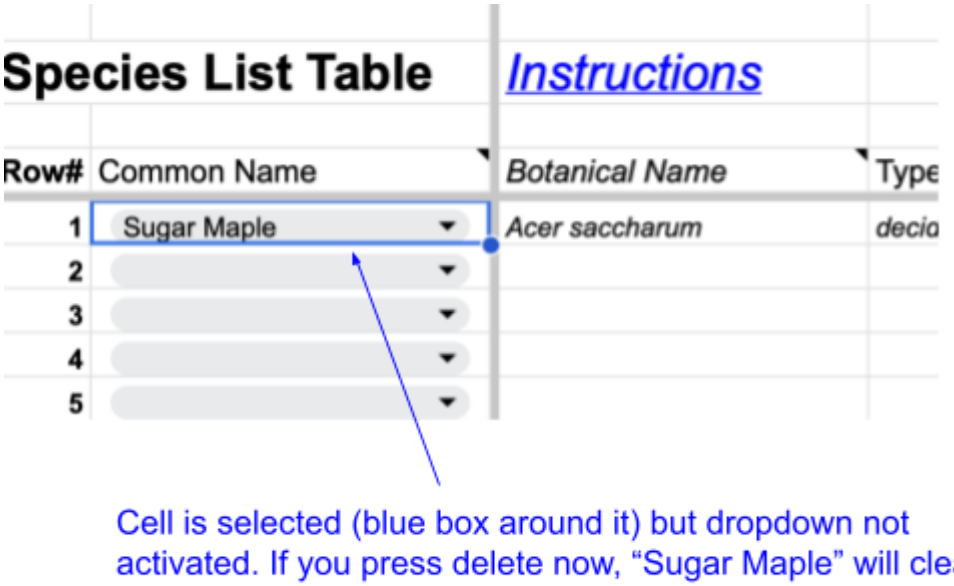
Cell C2 - Enter the planting area in m^2.
Cell C3 - Enter the planting density (trees/m^2). Note that the density of saplings is typically set to 3 saplings per square metre so generally you wouldn't change the number in Cell C3. However you can change this to a different density, if you wish.

Cell C4 calculates how many saplings you need for your site based on your planting area and desired density.

Column A: Common Names

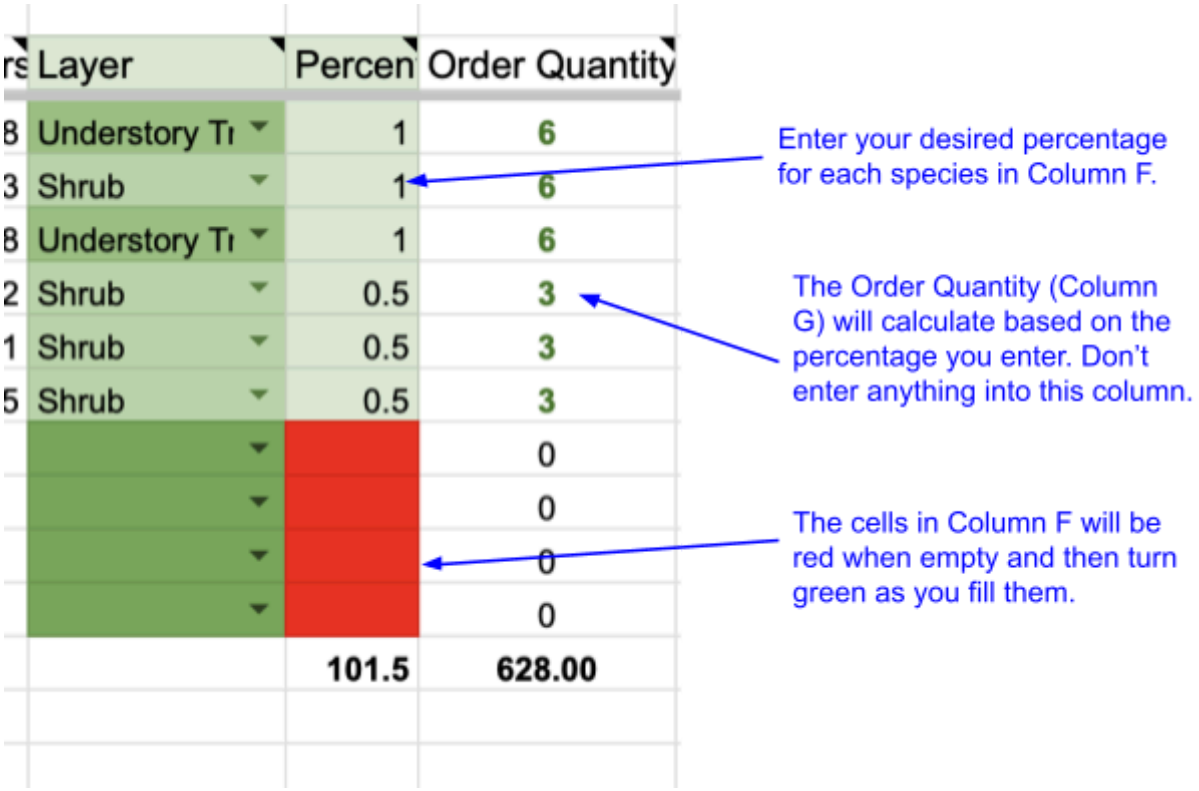
Select your species using the dropdown lists in Column A.

A note on clearing a cell with a dropdown list: If you've added a species and want to remove it (not just change it, which is simple), you just need to select the cell without actually selecting the dropdown list. So click in the small blank space next to the grey dropdown area. Or navigate to the cell with your keyboard. The cell should have a blue box around it but the dropdown list shouldn't be activated. Then just click delete on your keyboard. This will clear the selection but keep the dropdown list available.



Column F: Percentage

Column F is where you enter the percentage of each species you'd like in your forest (more info on choosing percentages below).



Outputs: Spreadsheet info that is calculated/populated for you

Columns B-E: Species characteristics

These columns populate with information each species including: Botanical name, Type, Height and Layer.

Column G: Order Quantity

This is the number of each species to be ordered and is calculated based on your planting area, density and the percentage of each species you input. It is rounded to the nearest whole number (this is why your "Actual Saplings" number in cell F4 will likely be a bit lower or higher than "Saplings" in C4).

Cell F7: Percent Sum

This will increase as you add species, and when it reaches 100 your list is complete.

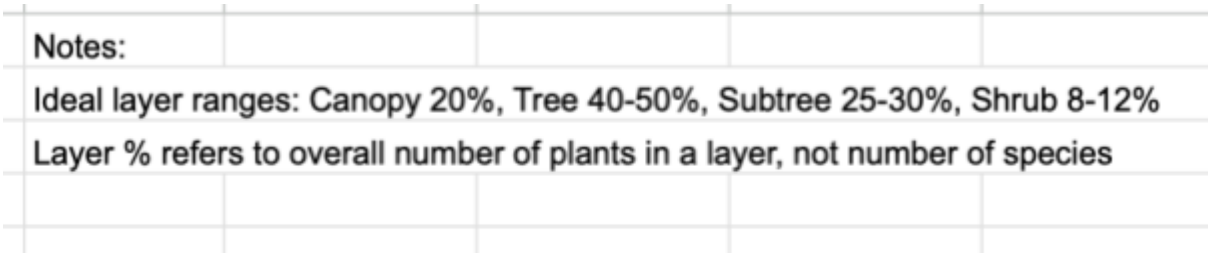
Layer Percentages Table

The table at the top of the spreadsheet populates with Layer percentages (percentage of species in each layer) as you fill in the percentages of each species in your forest. You can refer to this to ensure your forest will have the desired proportions of plants in each layer.

Layer Percentages:			
Canopy %	26.8	Understory Tree %	25.0
Tree %	38.2	Shrub %	10.0
Actual #Sapling	628.00	Total %	100.0

Layer Percentages Notes:

Next to the Layer Percentages table is a set of notes on ideal ranges for each layer percentage in a typical Little Forest. Note that these percentages could change if you are designing a different type of forest, and you don't need to match each range exactly to have a healthy forest, they are just a guideline.



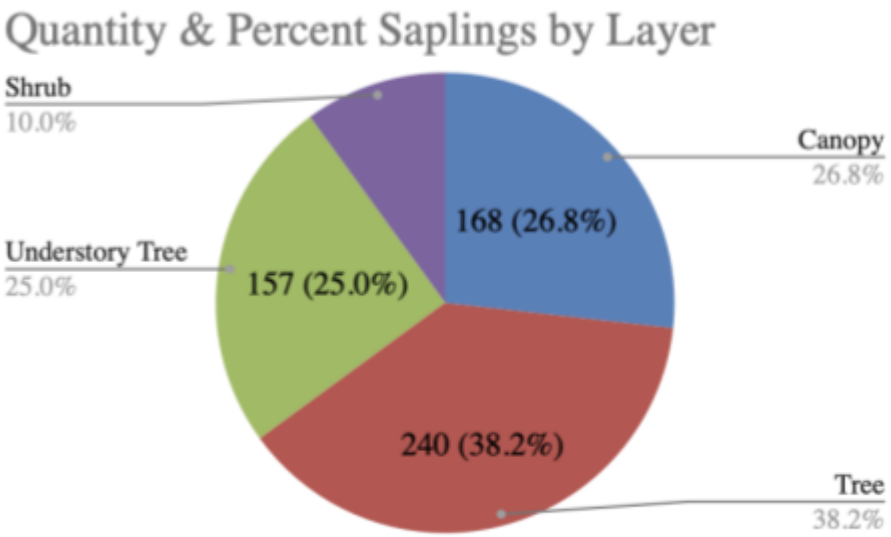
Notes:

Ideal layer ranges: Canopy 20%, Tree 40-50%, Subtree 25-30%, Shrub 8-12%

Layer % refers to overall number of plants in a layer, not number of species

Quantity & Percent Saplings by Layer Pie Chart

This is a visual representation of your forest that is updated as you enter your percentages. It shows the number of saplings in each layer and the percentage that this number represents.



Building your Species List

Notes:

If you wish to enter a species that is not in the Forest Builder Google Sheet, please contact us at chloe@littleforests.org to discuss!

Note 2: We typically aim for 35 species in a little forest. The SLGS is set up for 50 species - if you would like to add more species please contact us.

Note 3: The order that you input your species into your sheet does not matter. There is no need for numerical or alphabetical ordering - feel free to adjust percentages in your list, having the list “out of order” will not affect anything.

Step by Step Instructions

Step 1: Enter the planting area in square metres in Cell C2

This will determine the approximate number of saplings that will be planted in your forest.

Step 2: Choose your 5 Dominant Species.

These are the species that will be most abundant in your forest. Note that it does not matter what layer your dominant species are in, but keep an eye on your percentages as you add them to ensure you are building a forest with the desired proportions of plants in each layer. (Eg you probably don’t want to have all of your dominant species in a single layer as this will not give you the right proportions).

Step 3: Select the Common Names of your Dominant Species in Column B, and enter the percentages (8) in Column H

Use the dropdown lists in the first 5 rows of Column A to select the Common Names of your Dominant Species. Each of your 5 Dominant Species will be 8 percent of your forest, **so input "8" in the percentage column (Column G) in these rows**. Just enter the number 8, not the percentage sign.

Step 4: Choose and input your Supporting Species.

Choose 10-15 Supporting Species. These will range in percentage from around 2-5% in your forest.

- Again, use the dropdown lists in Column A to select the Common Names for each of these species.
- Begin with the species you want more of and assign percentages around 4-5%
- Then add species to your list with reducing percentages until you reach ~2%
- Keep an eye on your layer percentages. You can adjust the percentages of your species so that the layer proportions are appropriate.

Step 5: Enter your Rare Species

Choose approximately 10-15 species to be your Rare Species.

- Again, use the dropdown lists in Column A to select the Common Names for each of these species
- Input percentages from 0.5 - <2% for these species, keeping the layer percentages in mind

Step 6: Adjust

Once you have approximately 35 species in your list, **and the Percent Sum cell F7 is 100**, ensure that your layer percentages (table/pie chart) show the proportions you're looking for. If they don't, adjust percentages in your list accordingly (eg if your canopy layer percentage is too low, increase the percentage of a canopy species and decrease the percentage of another layer species. But do make sure that you have 5 dominant species, each at 8%.