



## PWS – POLYGON NATURE SPAWNER PACK

By Procedural Worlds

PWS – POLYGON Nature - Spawner Pack is a  
GeNa Pro and Gaia Pro Spawner kit for  
POLYGON Nature by Synty Studios.

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## About Procedural Worlds

Powerful, simple, beautiful. Friendly tools, gorgeous games!

Procedural Worlds empowers artists and developers to bring their vision to life by making it easy to create beautiful worlds. Leverage the latest procedural generation techniques to take the pain out of creating stunning environments and focus on creating amazing games.

The only end to end environmental generation and delivery suite:

[Gaia Pro 2021](#) - A world generation system for creating, texturing, planting and populating scenes from low poly mobile, VR and through to high end desktop.

[GeNa Pro](#) - A sophisticated localised level design tool that augments Gaia's broad-brush strokes, by working intuitively to give fine grained control.

[SECTR](#) - A suite of performance-enhancing tools that enable open world streaming, massive mobile games and includes the latest techniques in audio occlusion and propagation.

[Ambient Sounds](#) - Lets you configure music and sounds to create a unique atmosphere for each region in your game, which can react to changes in your gameplay instantly.

[Pegasus](#) - A cut scene and fly through creator that makes it easy to show off gorgeous environments and drive characters through scenes with localised avoidance and Mecanim animation support.

Spawner Packs – You can save time by using our pre-configured Procedural Worlds Spawner packs (PWS). The packs contain configurations for our tools Gaia and GeNa, and are designed to work with popular asset packs from the Unity Asset Store. Currently available:

[PWS – POLYGON Fantasy Kingdom - Spawner Pack](#)

[PWS – POLYGON Nature - Spawner Pack](#)

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# Introduction

Thanks for purchasing the Nature Spawner Pack!

The Nature Spawner Pack helps you to create awesome environments out of the modular POLYGON Nature pack from Synty Studios.

We automate the generation and placement of many of objects and structures provided by Synty and then use GeNa Pro to generate completely new and unique structures for you.

Be sure to check out the GeNa Decorators directory for examples of how you can use the GeNa Pro decorator system to add even more procedural capability to your system.

NOTE: This document will provide some advice on how to start, however for a more detailed understanding of Gaia Pro / Gaia Pro 2021, and GeNa Pro you can read the documentation provided with them and check out the tutorials at [Product Tutorials | Procedural Worlds \(procedural-worlds.com\)](#).

## Installation

Ensure that you have installed the following packages from the Unity asset store before installing the Nature Spawner Pack. This will ensure that all object references are correctly maintained.

[POLYGON Nature - Low Poly 3D Art by Synty](#)

[Gaia Pro 2021 - Terrain & Scene Generator | Terrain | Unity Asset Store](#)

[GeNa Pro - Terrains, Villages, Roads & Rivers | Terrain | Unity Asset Store](#)

It should still be possible to install the assets in any order, but you might see errors & warnings when e.g. the configurations from the Spawner Pack cannot find the original prefabs from the POLYGON Nature asset.

Then install the Nature Spawner Pack from Procedural Worlds. It will be installed into the following directories.

Procedural Worlds

Content Packs

Synty

Polygon Nature

Content Resources: Resources used by the pack.

Prefabs: Prefabs base for many procedural structures.

GeNa Decorators: GeNa decorator examples.

Documentation: Nature Spawner Pack documentation.  
Gaia Biomes: Gaia Pro Biome and Spawners.  
GeNa Masks: Handy masks for GeNa Terrain Flatteners.  
GeNa Roads: Contains a Road Profile for the use with the GeNa Roads system  
GeNa Spawners: GeNa Pro spawners, categorized

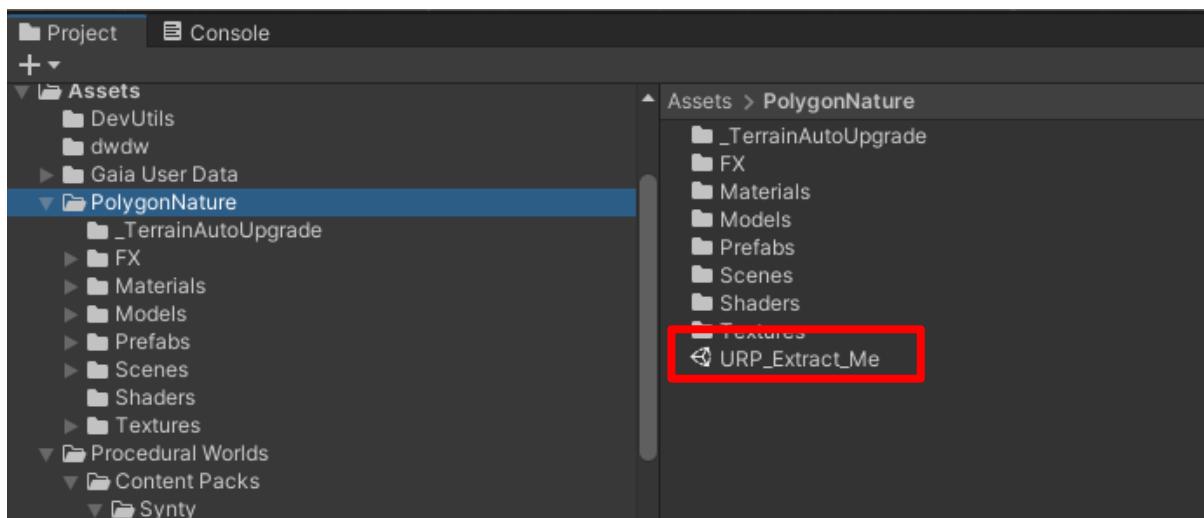
## Render pipeline support

Per default both the POLYGON Nature pack and the PWS spawner pack are configured for the built-in rendering pipeline.

When installing into URP or HDRP you will also need to install additional packages for rendering pipeline support.

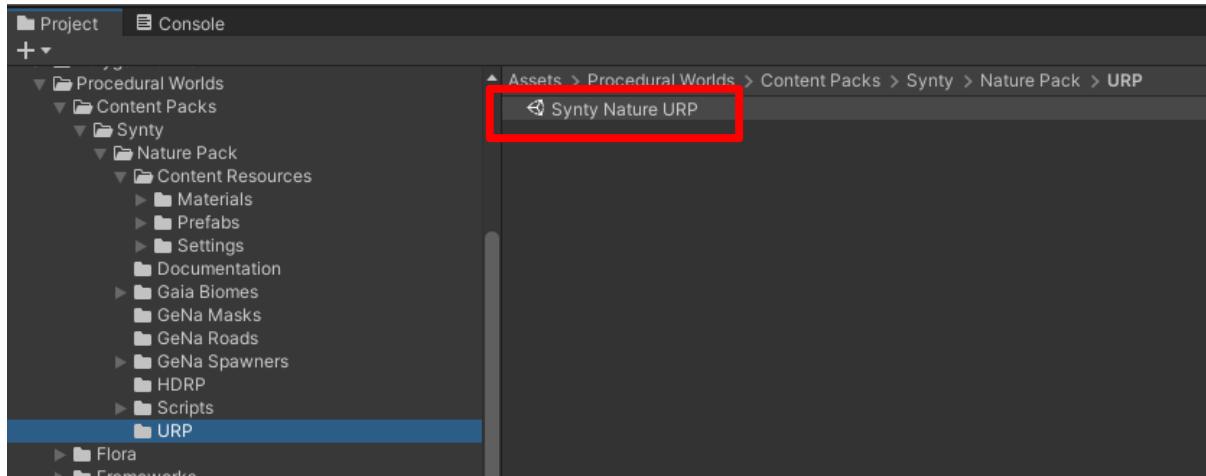
### Installing for URP

The POLYGON Nature asset comes with an installation pack for URP by default. It can be found at the root of the installation folder here:



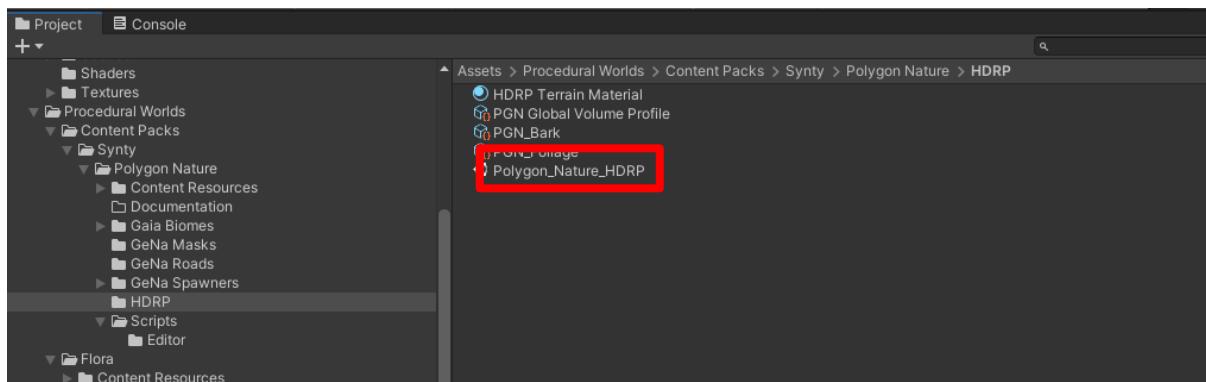
Double click the package file to install it to update the Synty assets for the URP pipeline.

For our own materials, we also included a package file as well. Please double click on this file here to update some internal materials from the PWS Spawner Pack:

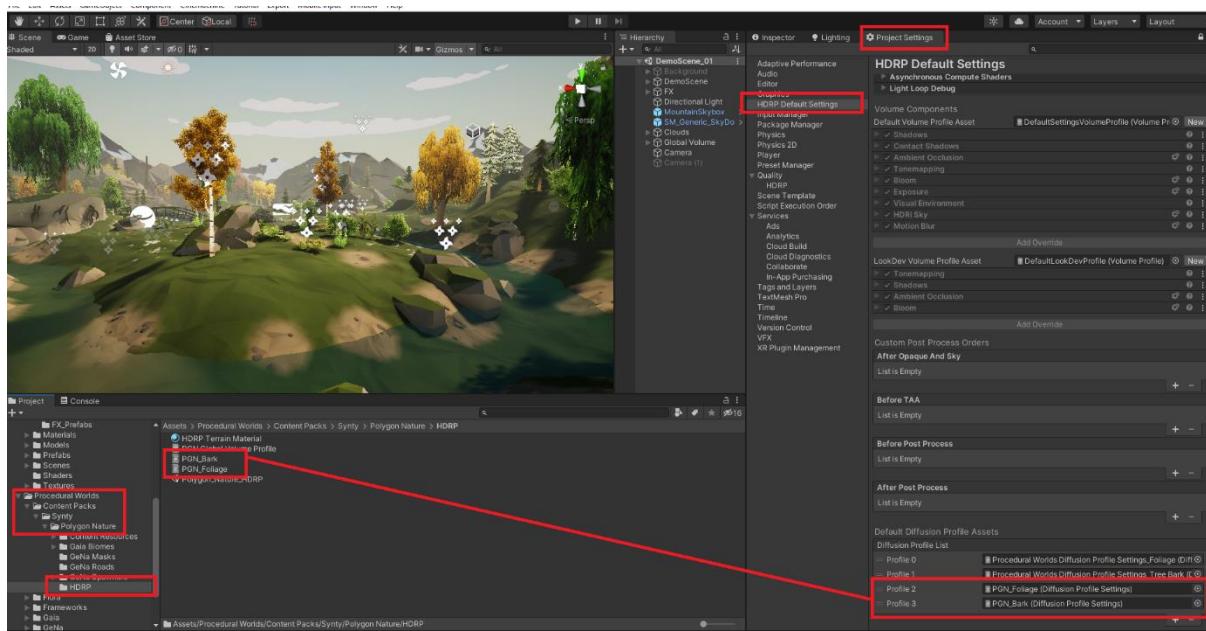


## HDRP

The POLYGON Nature asset does not officially support HDRP at the moment, but we added an unofficial HDRP support pack that you can use to work in HDRP. You can find it in the Nature Spawner pack here:



To install these files, simply double click them and they will extract their contents over the existing POLYGON Nature asset, making it compatible with the respective pipeline. Then please also add the diffusion profiles to your HDRP Global settings so that the plants are rendered correctly:



## Tutorials, Chat, Ticketed Support

Discord: <https://discord.gg/TggjONN>

Website: <https://www.procedural-worlds.com/>

Tutorials: <https://www.procedural-worlds.com/support/tutorials/>

Support: <https://www.procedural-worlds.com/support/>

Newsletter: <https://www.procedural-worlds.com/subscribe?referrer=UnityEditor>

# Using the Nature Spawner Pack

## Typical Workflow

The Nature Spawner Pack is designed to be used with Gaia and GeNa.

A typical workflow would be to

1. Create a Unity terrain with Gaia using the Polygon Nature biome;
2. Populate it with GeNa;
3. Optionally finish it off with a full Biome Spawn with Gaia;
4. Optionally convert the Unity terrain to a low poly mesh terrain with Gaia.

Please note: While this is a suggested workflow you do not need to follow it. With GeNa Pro you can quickly add enhance any Unity scene. Most of the spawners will work on both Meshes and Unity terrain, however you will lose access to some features such as terrain flattening as this only works with Unity terrains.

You could decide to use all, some or none of Gaias Runtime system for lighting or water.

## Asset Layout

Here is a brief overview of the more important content directories. Please note that the POLYGON Nature asset comes with “Low Poly” variants of the prefabs – this means that some of the assets come with a variant with an even more reduced art style e.g. for the use on mobile devices. For example this fern:



Left you can find the more detailed variant with a cutout texture, left the solid variant. Where we found these alternative assets, we created “Low Poly” or short (LP) variants of the spawners as well, so you can decide which art style you want to spawn for those assets.

The most important content directories are:

Gaia Biomes:

Gaia Pro Biome and Spawners. The “Low Poly” Subfolder contains the Low Poly variant of the Biome.

GeNa Spawners / Campfire:

Spawns variations of the campfire asset with / without vegetation.

GeNa Spawners / Cave:

Spawns variations of the cave entrance asset with / without vegetation.

GeNa Spawners / Cliff:

Different variations of cliff spawners based on the cliff overhang assets in the pack.

GeNa Spawners / Extra:

Various mixed smaller assets.

GeNa Spawners / Particles

Spawner for the different particle systems that come with the pack. Use these to enhance your scene with particle VFX

GeNa Spawners / Rocks

Variations of Rocks in different sizes and with and without vegetation. Great to enhance steep areas on the terrain, and also to block off areas from traversal by the player.

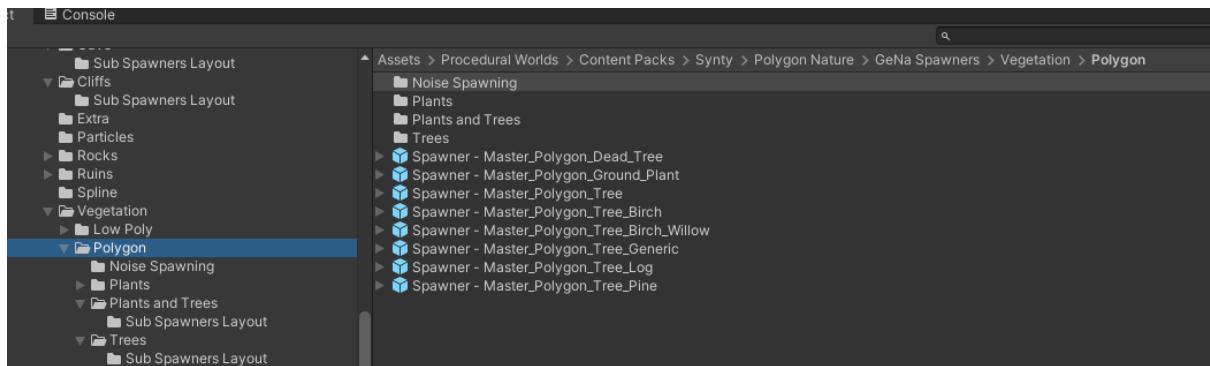
GeNa Spawners / Splines:

Spawners to spawn a fence or a stone path. These spawners can either be used stand-alone or along a spline.

Note: Many of the other GeNa spawners can also be used along a spline.

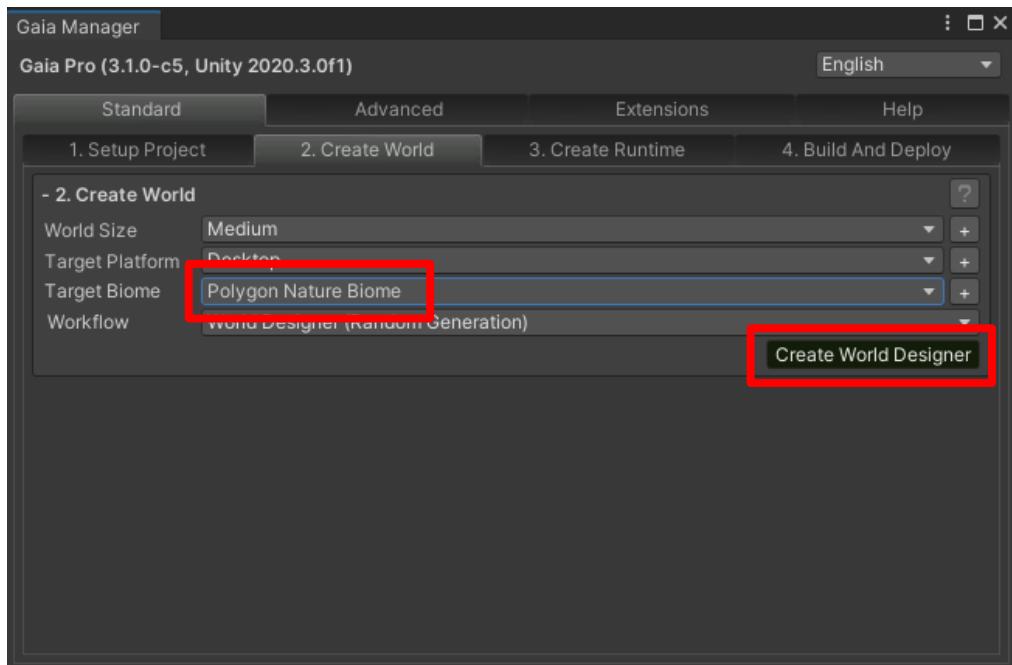
GeNa Spawners / Vegetation:

Spawners for all the different kind of vegetation in the pack. You can either choose spawners for a very specific asset to e.g. spawn a specific tree, or go for the more generic Noise / Plants / Plants and Trees / Trees subfolders, those contain spawners with mixed assets.

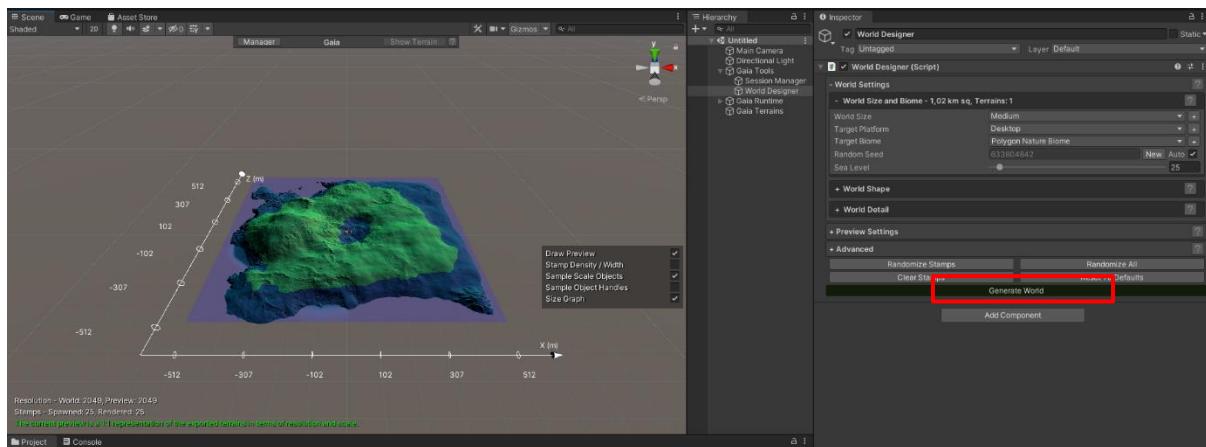


## World Creation with Gaia Pro

In this example I will create a base world with Gaia Pro 2021.

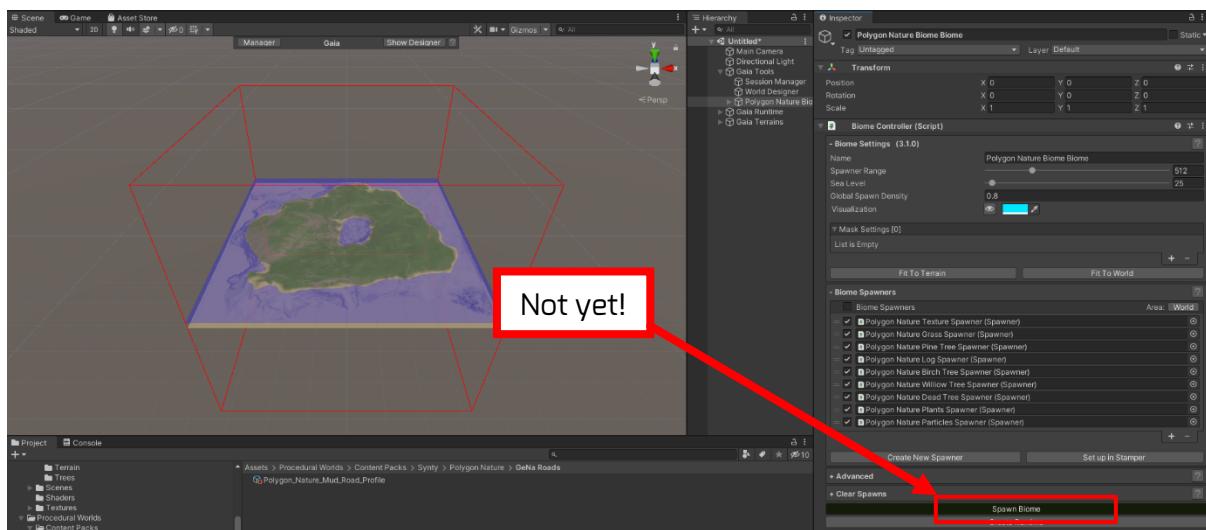


Select “Polygon Nature Biome” as the Target Biome and generate a base world either manually or with the World Designer. We will use the World Designer.



The world designer is a tool that is more explained in detail in the Gaia Quickstart Guide and in the documentation. If you are not too familiar with it, you can press “Randomize All” to get a new world each time.

When you are happy with your preview hit Generate World.

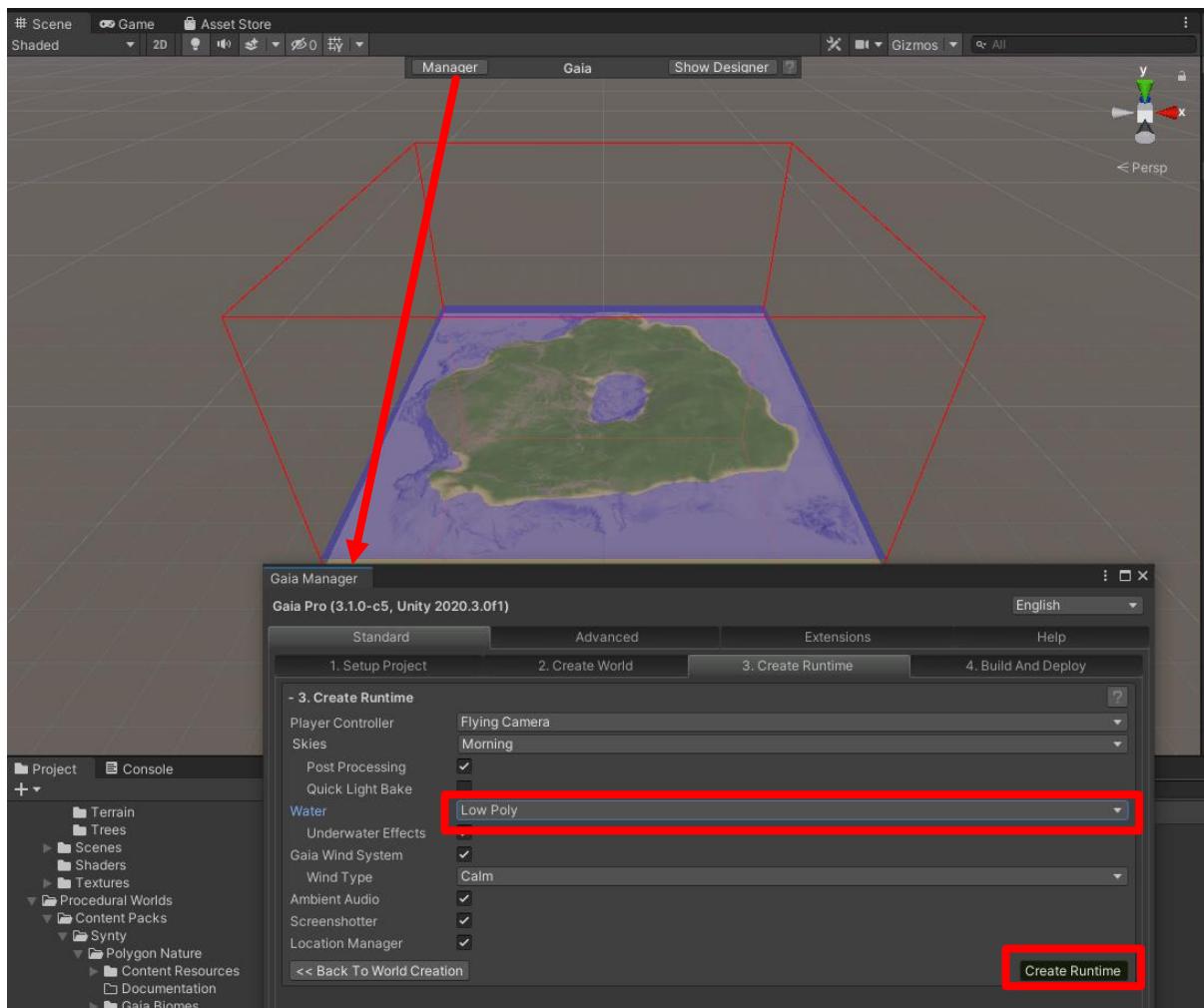


This will create and texture your terrain, and when it is complete it will select the biome object and present you with the option to Spawn the full Gaia Biome.

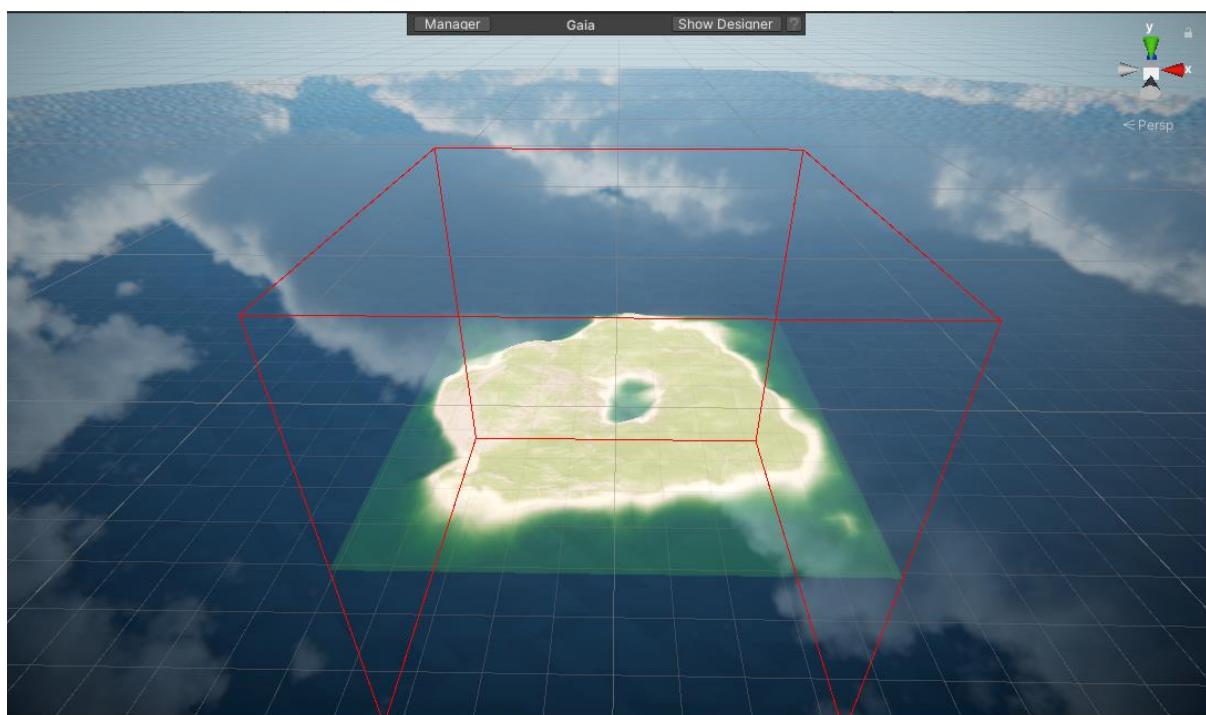
Do not do this yet – it is far easier to work on a clean terrain than on one that has already been filled with content. You can *optionally* do this at the end if you still think you need more content in your scene.

The next optional step is to add the Gaia runtime into your scene. Gaia runtime sets up lighting, post fx, water, camera etc. You do not need it, but it makes the development experience nicer. You can remove it later as desired.

Click on the Manager button to open the Gaia Manager. Select Low Poly on the water if you would like a low-poly style for your water, and then hit Create Runtime.



Magic happens...



And you can now press play to survey your (currently still empty) new scene. A cool trick is to hit F11 to go into Photo Mode with Gaia Pro 2021 where you can play with lighting, post fx etc.

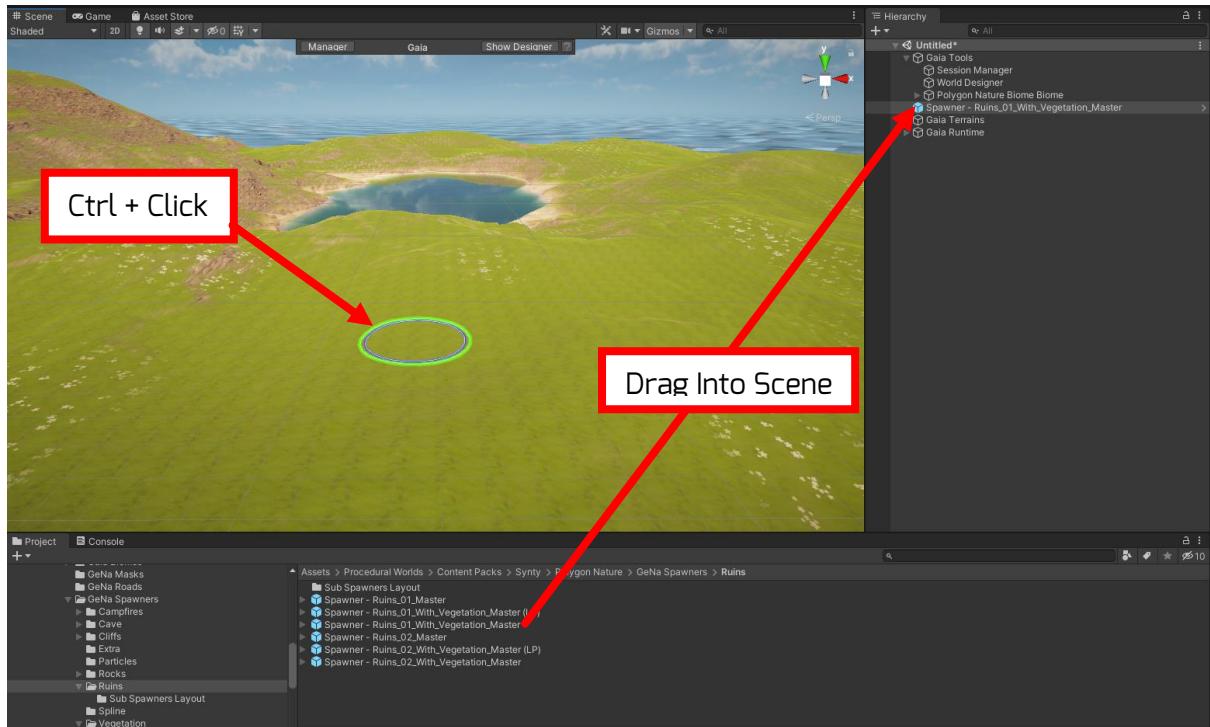


## World Population with GeNa Pro

### Spawning

To use the GeNa spawners, drag the GeNa spawner prefab into your scene. Hit Shift+Left Mouse click to sample your terrain. GeNa will also give you a visualization of where the structure will be spawned.

GeNa will child any prefabs or splines it spawns into your scene underneath the terrain of the scene it was spawned on. This is so that things like Gaia's Terrain streaming system can manage object loading and unloading correctly.



Hit Ctrl+Left Mouse click to spawn at that location.



A ruin asset was automatically assembled out of different prefabs. Note that usually you would need to arrange those parts – walls, plants, the terrain texturing – all by hand, while here you can spawn these ruins with a single click.

## Iterating

Many of the GeNa spawners offer multiple variations on the same basic structure, so you can have fun ‘iterating’ the spawn result until you get the one you want.

To do this, first hit Ctrl+Left Mouse click to spawn, and then without de-selecting the spawner iterate the spawn by hitting Ctrl+Shift+I to get another version of it. Keep Iterating until you get what you want.

GeNa will switch the visualizer off while you are doing this in order to make it easier to see the final result.

Here is some iterated variations of the same ruin spawner:



## Undo

You can undo any GeNa spawn or spline operation by hitting Ctrl+Z.

## Fixed Rotation Spawning

Some GeNa spawners are set up to operate in Fixed Rotation mode. Fixed rotation allows you to change the direction that the object will spawn.

Fixed Rotation is indicated with a blue arrow that shows the direction that the object will be rotated in when it is spawned.

Hold the left Shift key, and click and drag the mouse to change the direction that the object will spawn in. The blue direction pointer will update to show you the new direction.

When you have selected your rotation then spawn as usual with the Ctrl+Left Mouse click.

This technique enables precise orientation of your structures easy to achieve. It is also very useful when used in conjunction with splines.

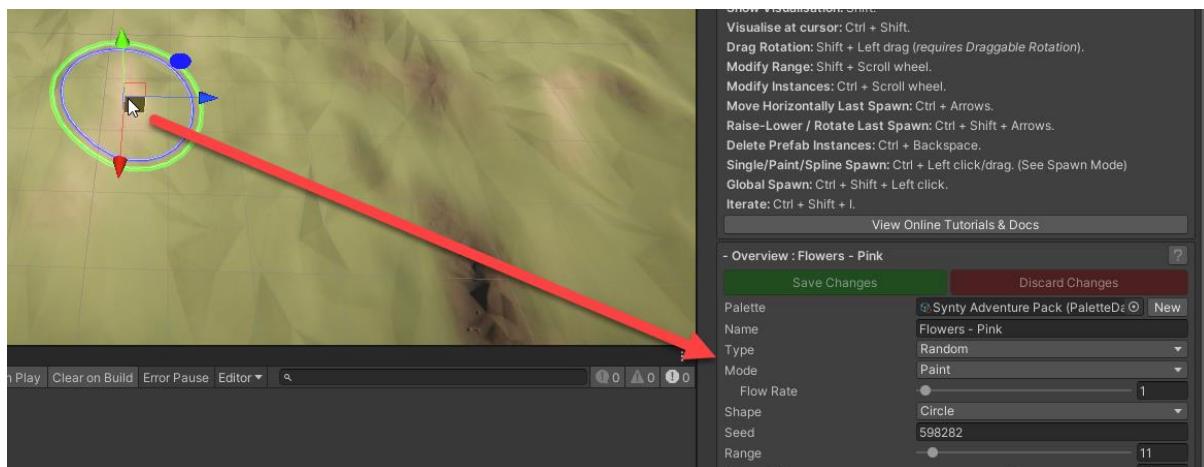


## Paint Mode

Some GeNa spawners are set up to operate in “Paint Mode”.

With these spawners you can hit Ctrl + Left Mouse Click to spawn, and then drag your mouse to continue to “Paint” your objects into your scene. The flow rate is the distance that you need to move before the next spawn iteration is executed.

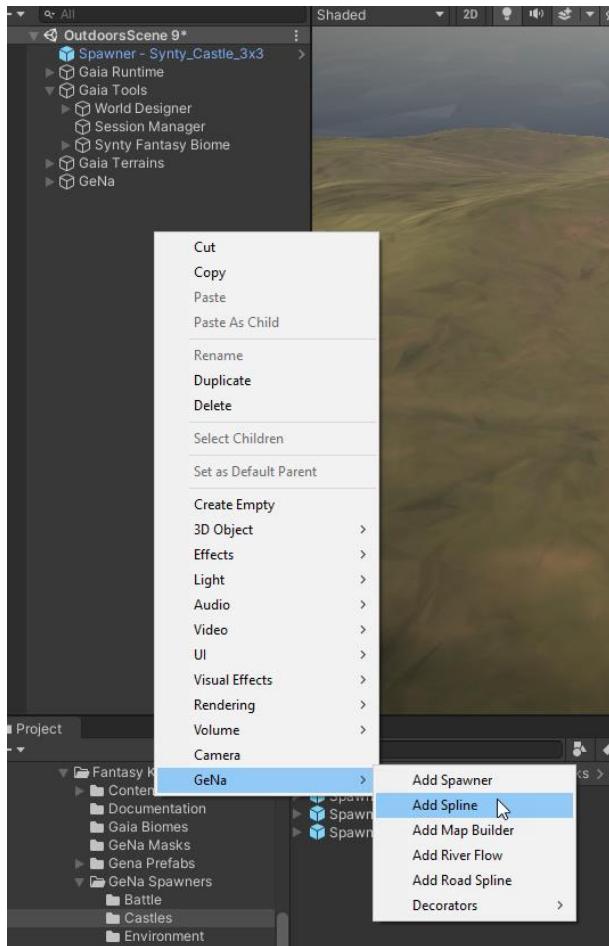
If you do not like what it did, you can then hit Ctrl+Shift+I to Iterate and get another version of the paint operation, or Ctrl+Z to undo it.



## Splines

Paths, walls, hedges, and other interesting path-based effects can also be spawned along GeNa Pro Splines.

To add a spline to the scene right click in the hierarchy and select “GeNa -> Add Spline”



Hit Ctrl+Left Mouse click to add nodes to the spline.

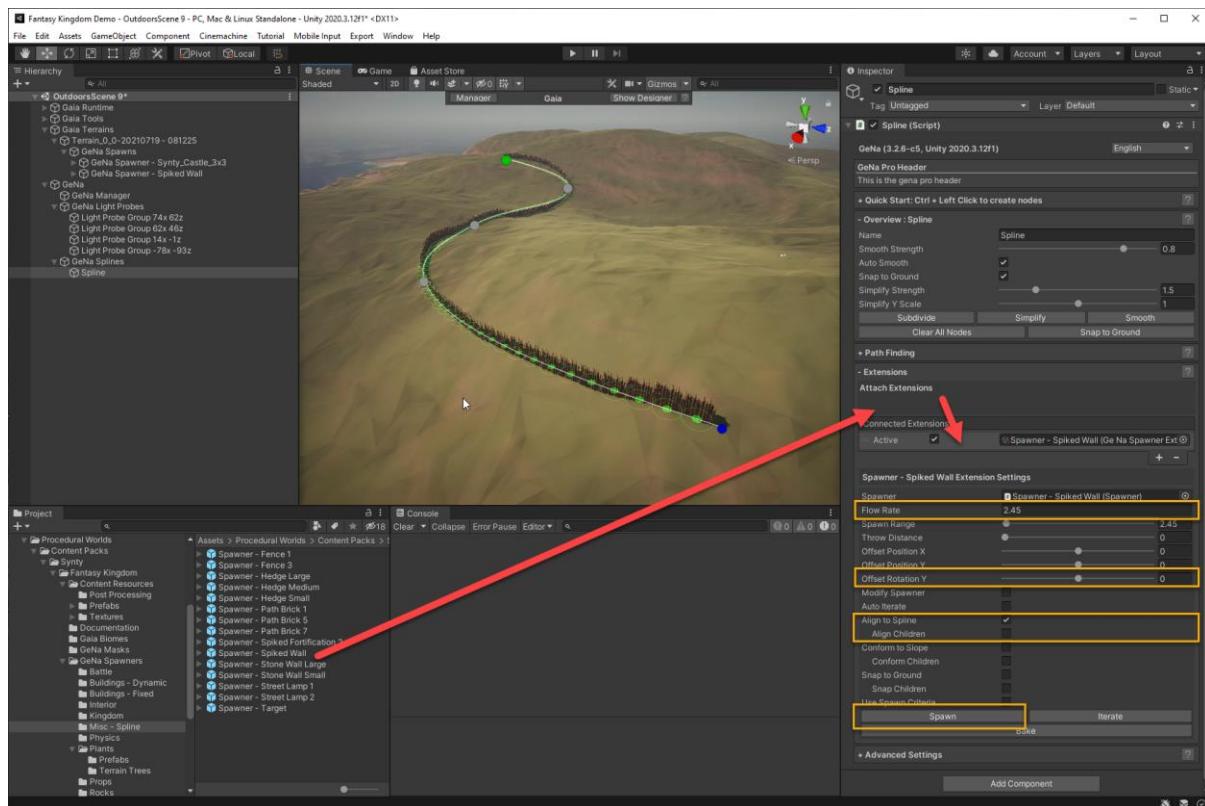


Drag and drop a spawner onto the spline.

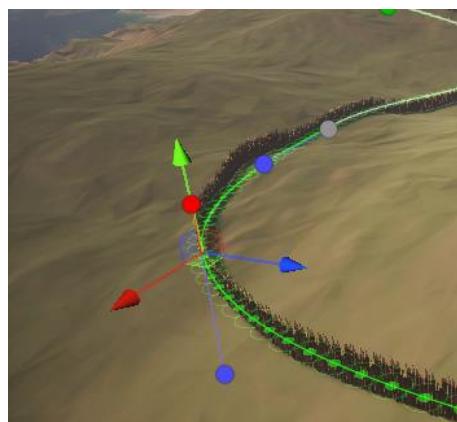
Adjust the flow rate – this controls the distance between spawns.

Click align to spline – optional but is often used in conjunction with Offset Rotation Y to change the angle of the objects along the spline. You can experiment with these settings to get the look you want.

Hit the spawn button to spawn along the spline.



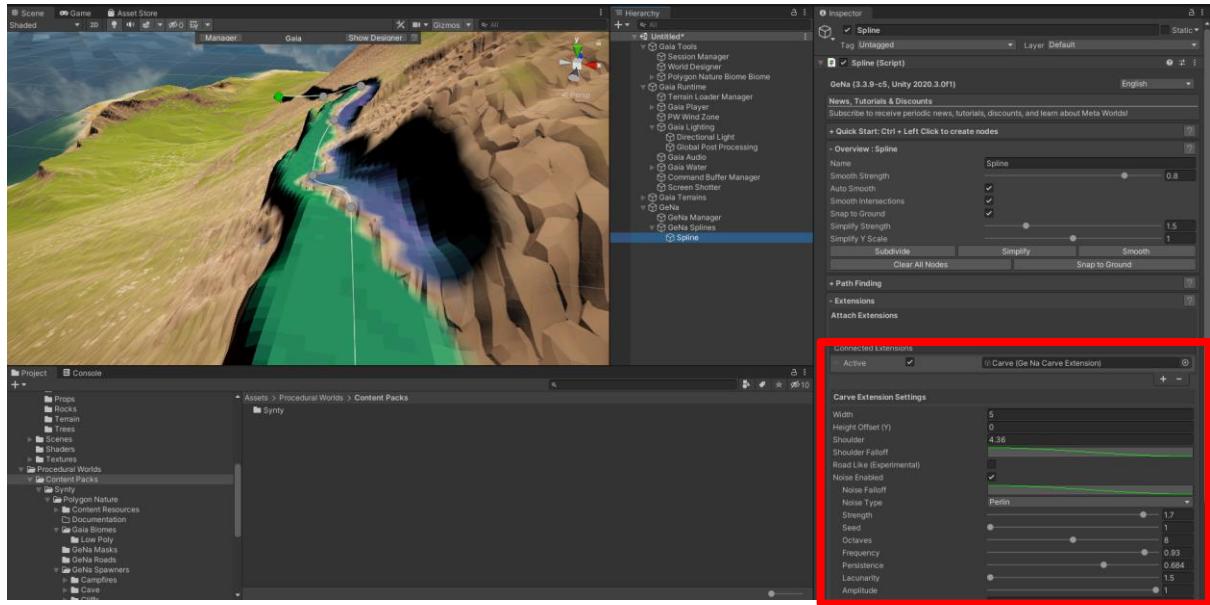
You can further refine this at by clicking on the spline nodes and modifying them (note – only works with prefab spawns). If you are unhappy with more permanent spawn types such as terrain trees, texturing or carving then hit Ctrl-Z first.



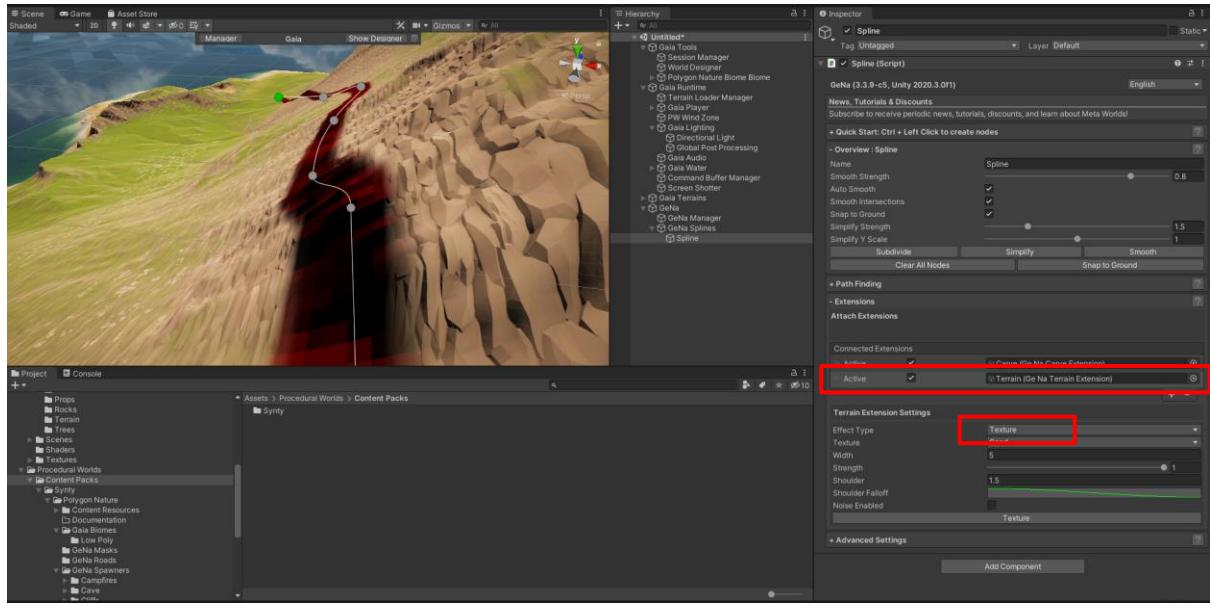
## Using Spline Extensions

GeNa Pro allows you to mix and match as many spline extensions as you like. I prefer to build on them one at a time, and then bake the result when I am done. Baking is the process of finalizing the operation being performed by the extension. In general you want to do this when you are comfortable that you are done.

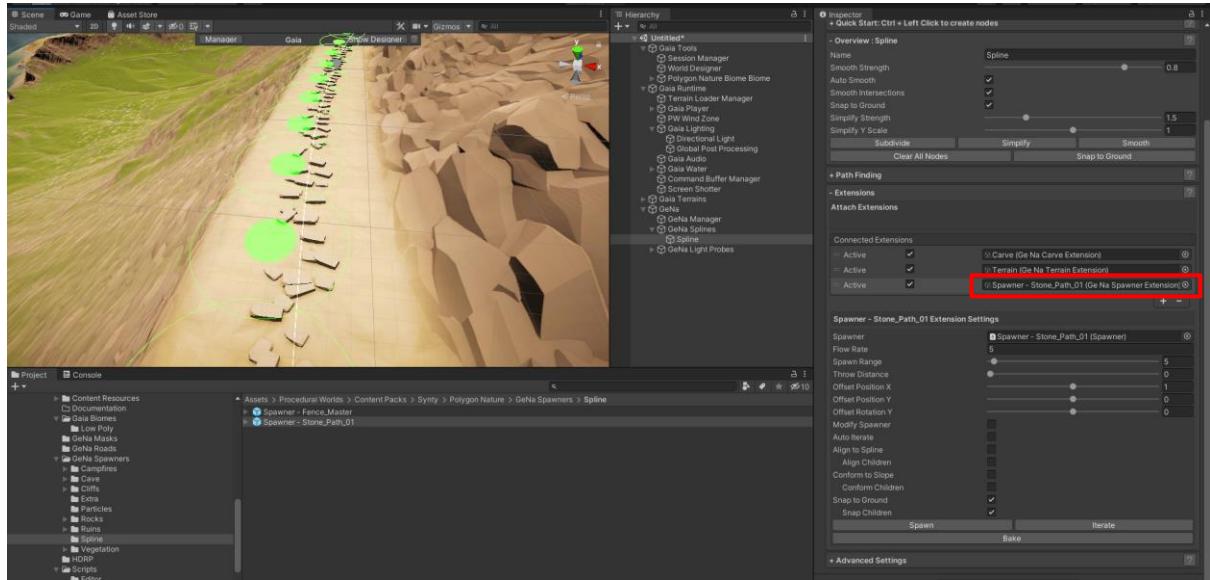
To carve and flatten the terrain along a spline, for example when creating a road, you can use the carve extension.



To texture the terrain along a spline, you can use the terrain extension in “Texture” mode:



And finally, you can also add spawner extensions to spawn things along the spline. For example you can spawn the stone path meshes for creating a path along the terrain:

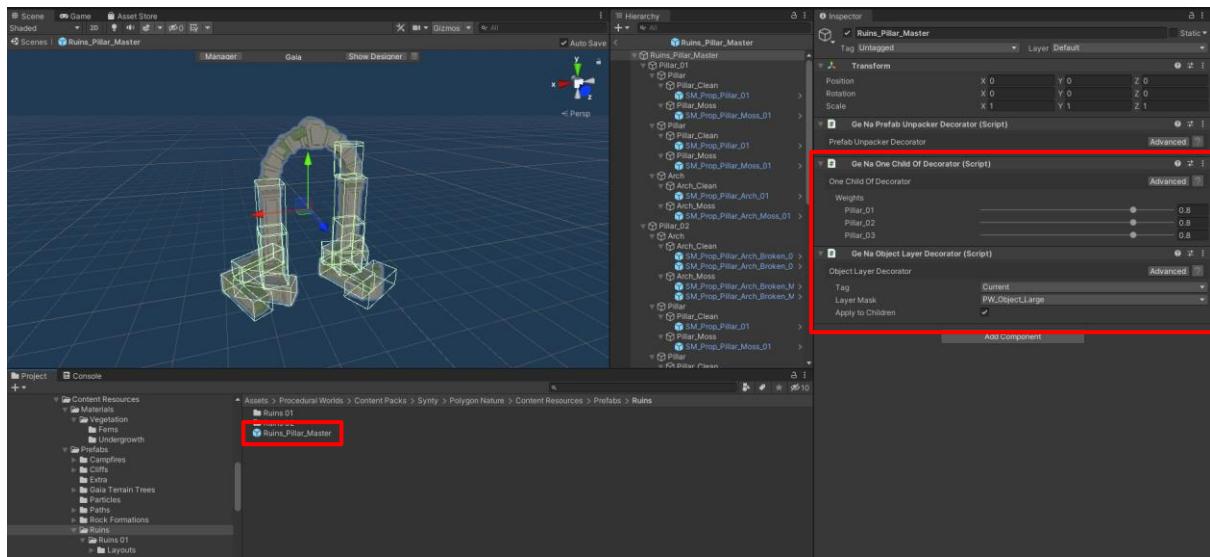


## GeNa Decorator System

GeNa comes with an exceptionally powerful decorator system, and this allows you to exert a high degree of control over how your content is spawned into your scene.

You see how many of the spawners were configured by looking at them in Procedural Worlds/Content Packs/Synty/Polygon Nature/Content Resource/Prefab.

Here for example we have a pillar object that uses the “Child Of” and a “Layer” decorator:



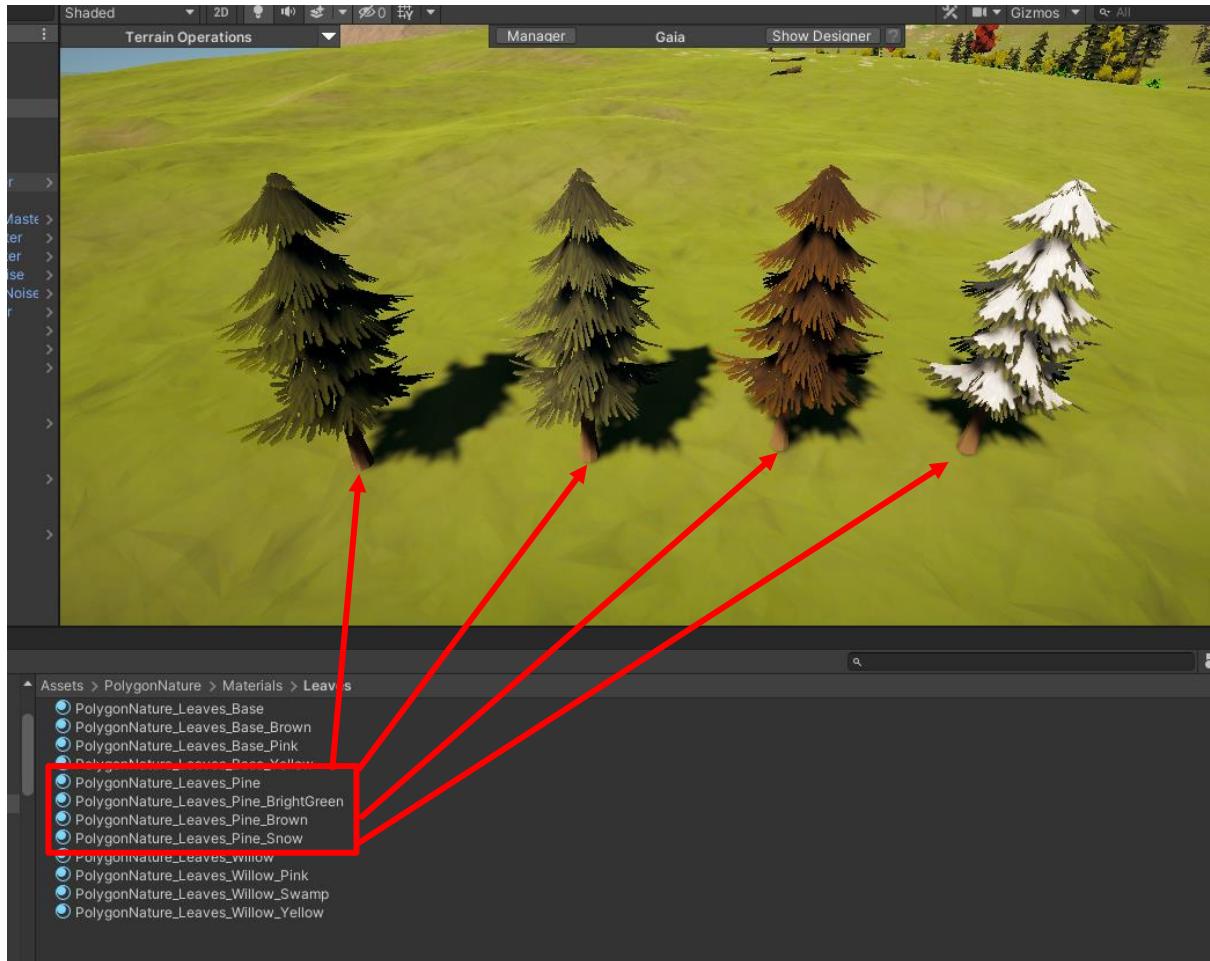
To use this prefab, drag it onto a spawner. GeNa will unpack the prefab, randomly choose to spawn only one of the children, and will put that child onto the PW\_Object\_Large layer.

Study how these were configured and use the ideas to set up your own content decorators.

For more information on Decorators, please read the GeNa Documentation.

## Using the Material Decorator

The POLYGON Nature asset comes with material variants for most vegetation assets – this means that e.g. a tree can be displayed with different materials for different seasons:



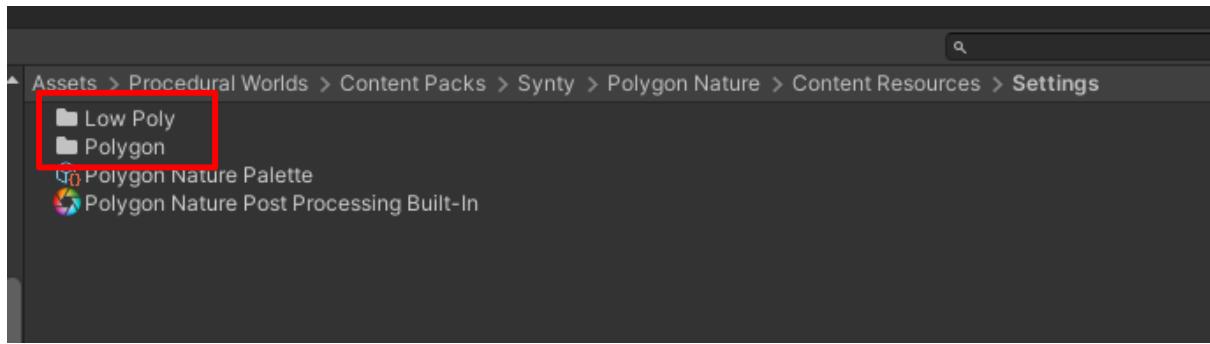
Swapping out these materials on all spawned instances would be tedious / time consuming, which is why we added a material decorator to the pack. This allows you to control which materials are being used during spawning. You can either select one single material that is supposed to spawn always, or set up a chance distribution. (e.g. 10% of the trees should appear brown)

Since the same material can appear across different prefabs in different spawners, we bundled the settings in material profiles. In this way you can control the materials across all spawners from a single access point. You can find these in the directories

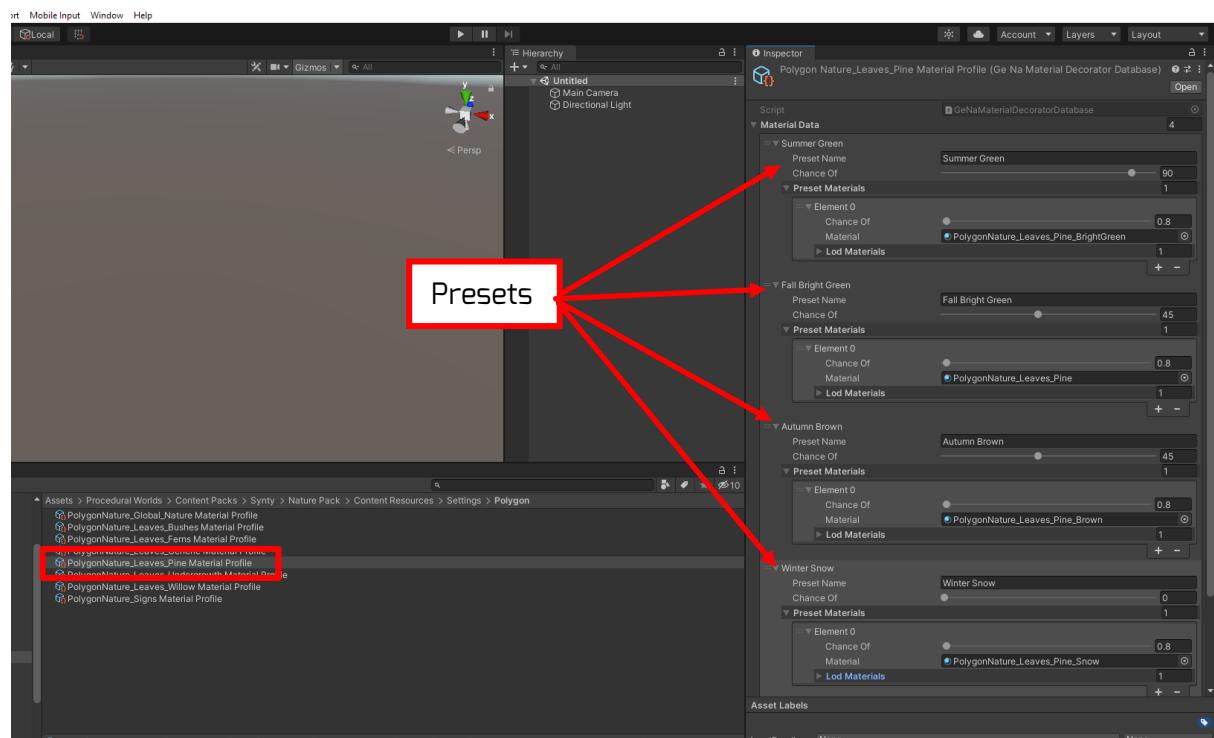
`Assets\Procedural Worlds\Content Packs\Synty\Polygon Nature\Content Resources\Settings\Polygon`

and

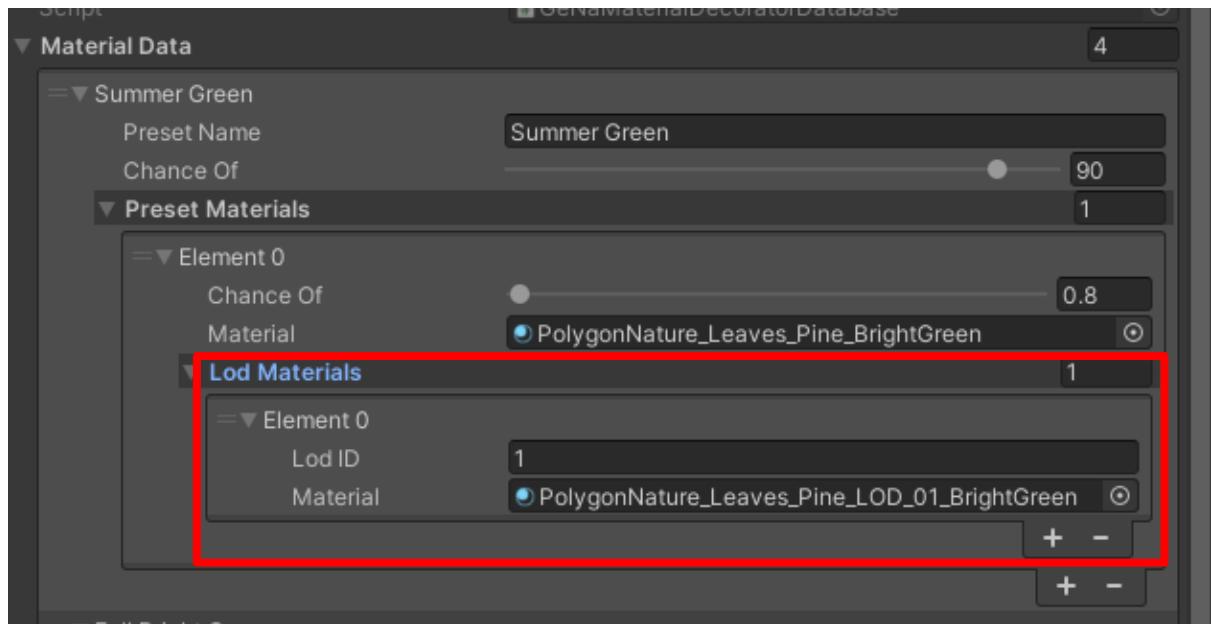
`Assets\Procedural Worlds\Content Packs\Synty\Polygon Nature\Content Resources\Settings\Low Poly`



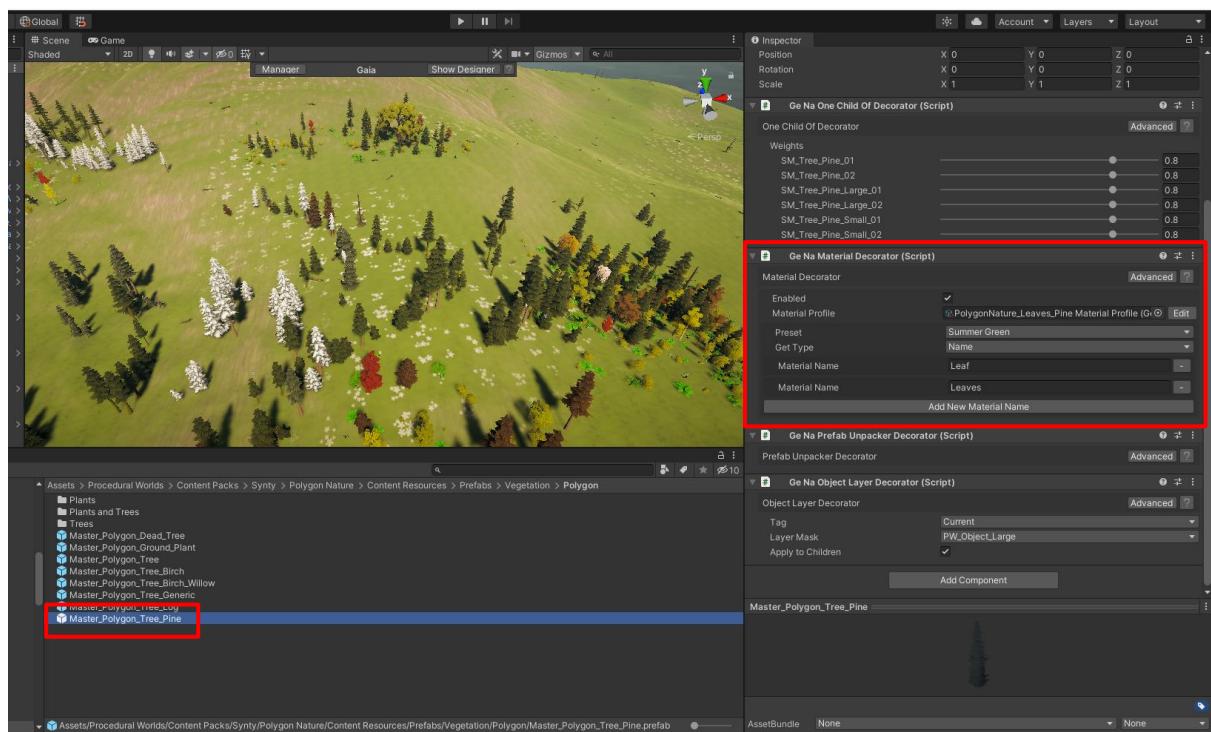
The material profiles allow you to define different presets with a chance value. The presets itself are collection of materials where each material also has a chance value as well.



The material targets the first LOD of the model. If the model has multiple LODs with different materials (e.g. a tree with a billboard LOD) you can also assign different materials for LOD levels:

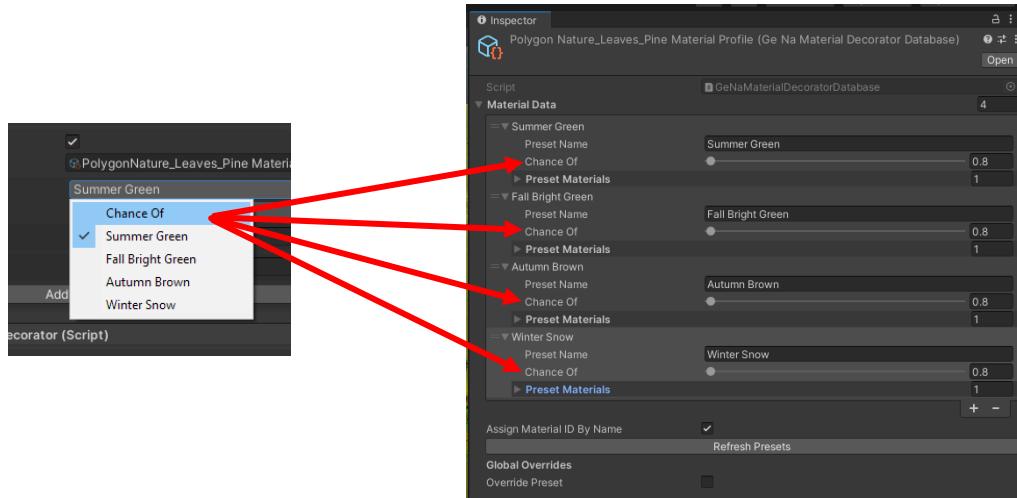


These Profiles are then used in the GeNa spawners in the following way: When setting up a prefab, a material decorator can be setup in which the material profile can be assigned:

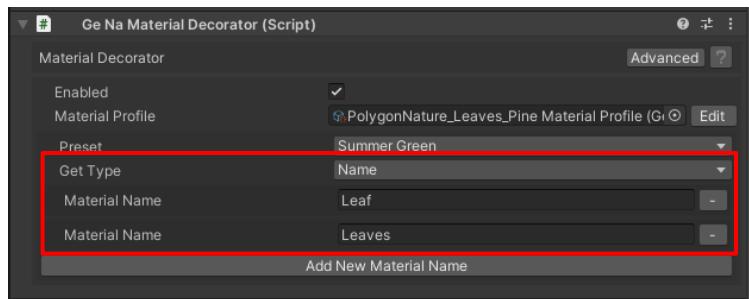


You can then pick a preset from that profile that should be used to determine which set of materials (with the respective chances) should be used when this prefab is being spawned. E.g. if the “Red and Blue” preset is picked that contains a red and a blue material both with a chance of 50% each, you should see an even distribution of red and blue objects when spawning.

If you select “Chance of” one of the presets will be picked according to the preset chance.

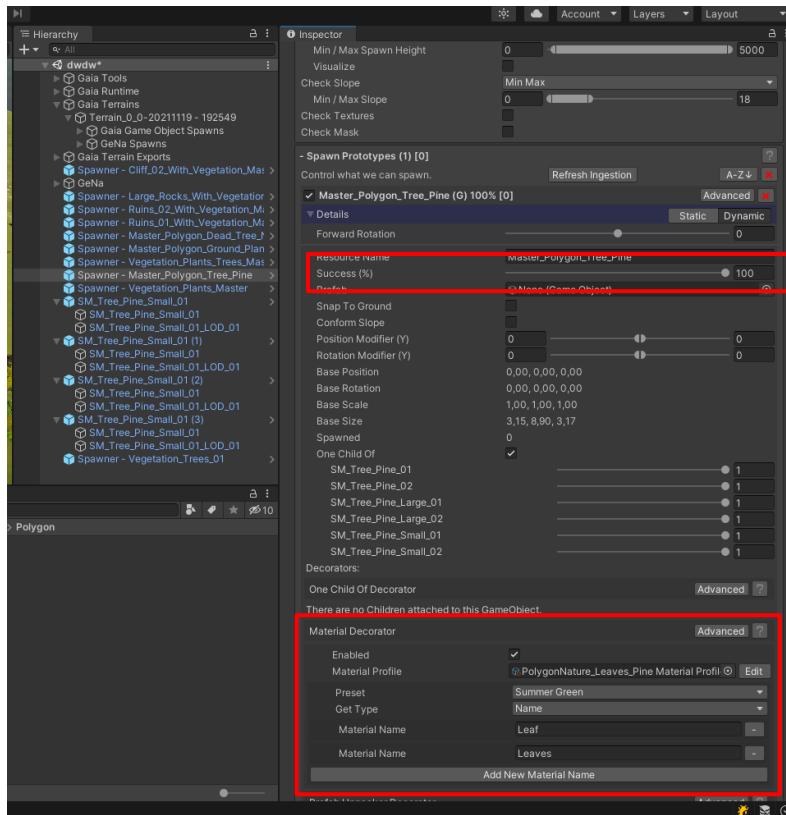


The Material Decorator lets you also control how / which material in the prefab should be switched out. You can either select to find the material by name (if it contains a certain keyword in the name) or by ID / Index number.

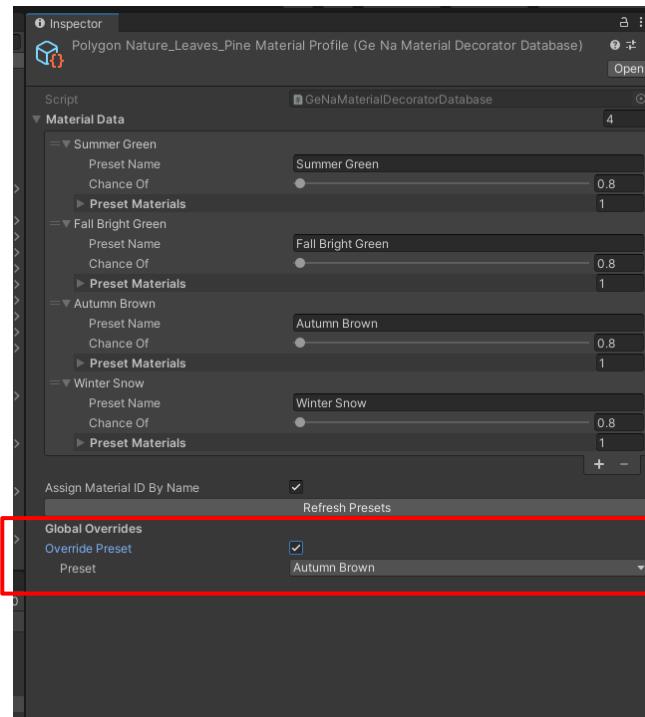


In the screenshot above, the material decorator will look for materials containing the terms “Leaf” and “Leaves” in the material name and will swap them out with the selected material from the Material Profile during spawn.

If you want to change which material is chosen for one of the already existing GeNa spawners, you could either look in the spawner to find the material decorator, and change the preset for it:



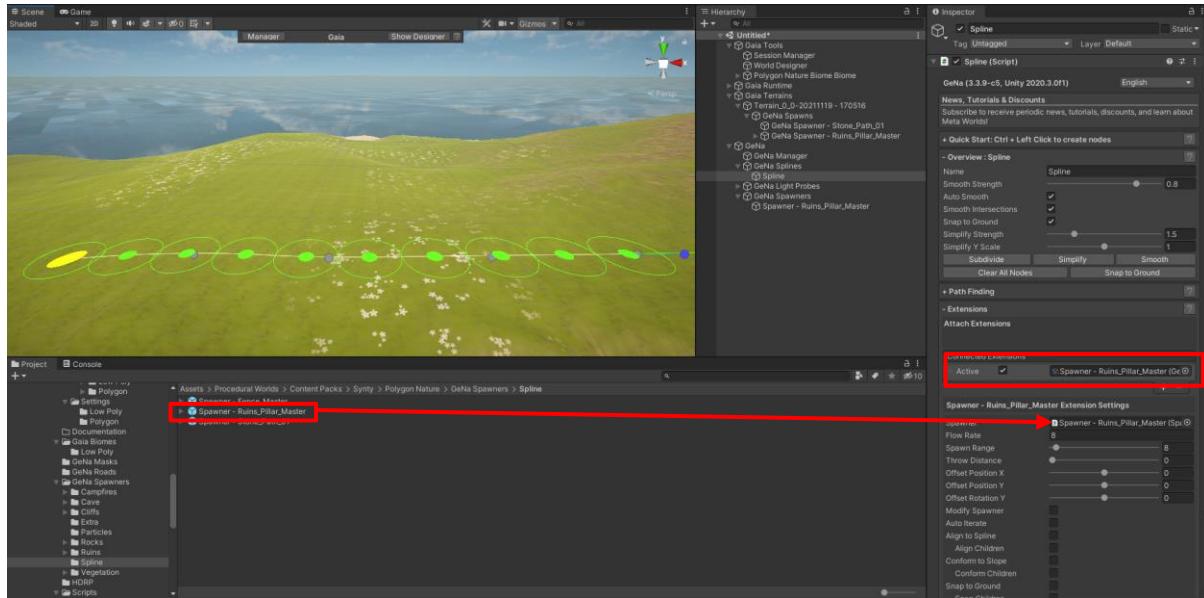
Alternatively, you can select the Material Profile and use the override at the bottom – this will override the selection for all (!) spawners where this Material Profile is in use. This is very convenient if you want to make sure the entire scene uses a specific set of materials only.



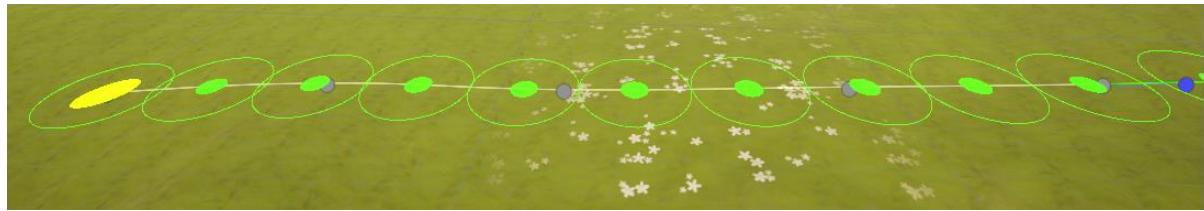
With the screenshot above, all pine trees would appear in “Autumn Brown” while spawning.

## Other Spline Examples

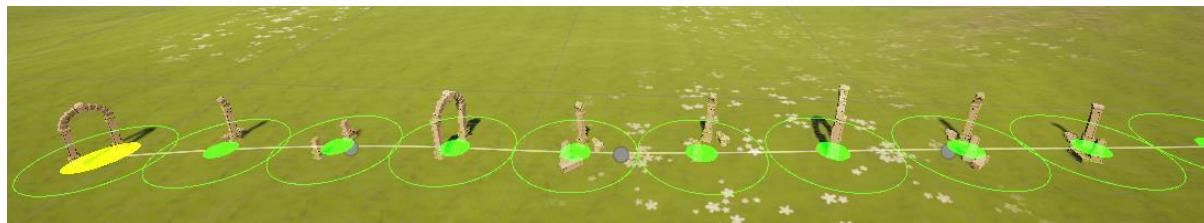
In this example we will position and rotate pillars so that they make a nice pathway. Create a new spline, and add the Ruins\_Pillar\_Master spawner to it in a spawner extension.



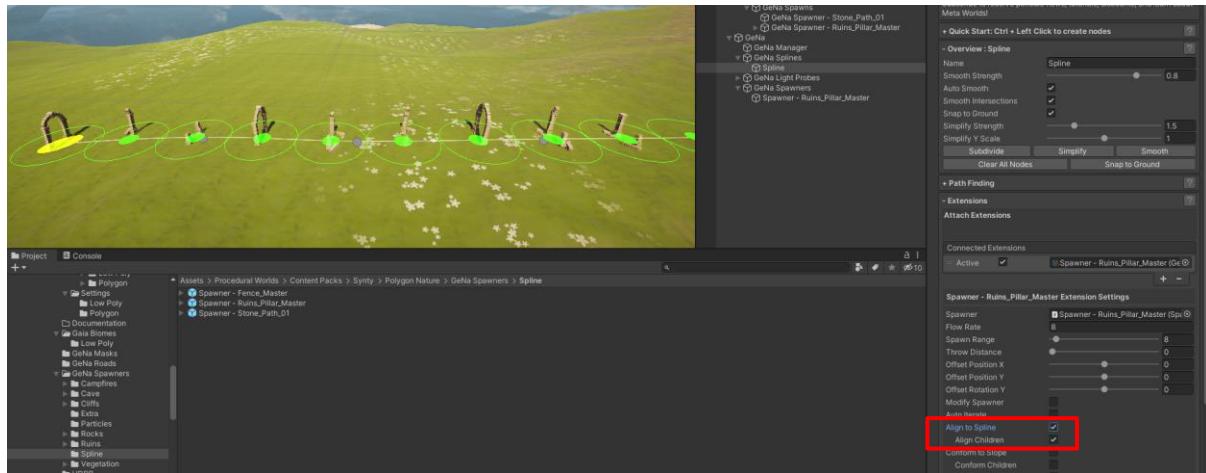
Ctrl+Left click to add spline points onto the terrain where the pillars should spawn:



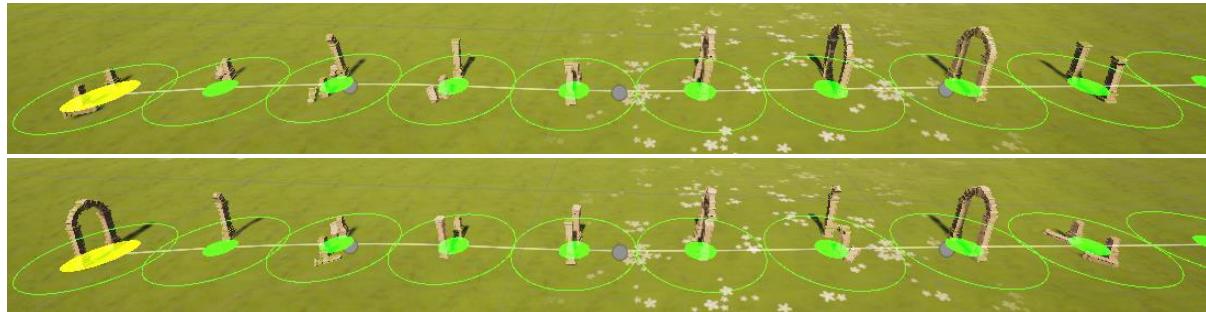
Click on the Spawn button in the Spawner Extension of the Spline:



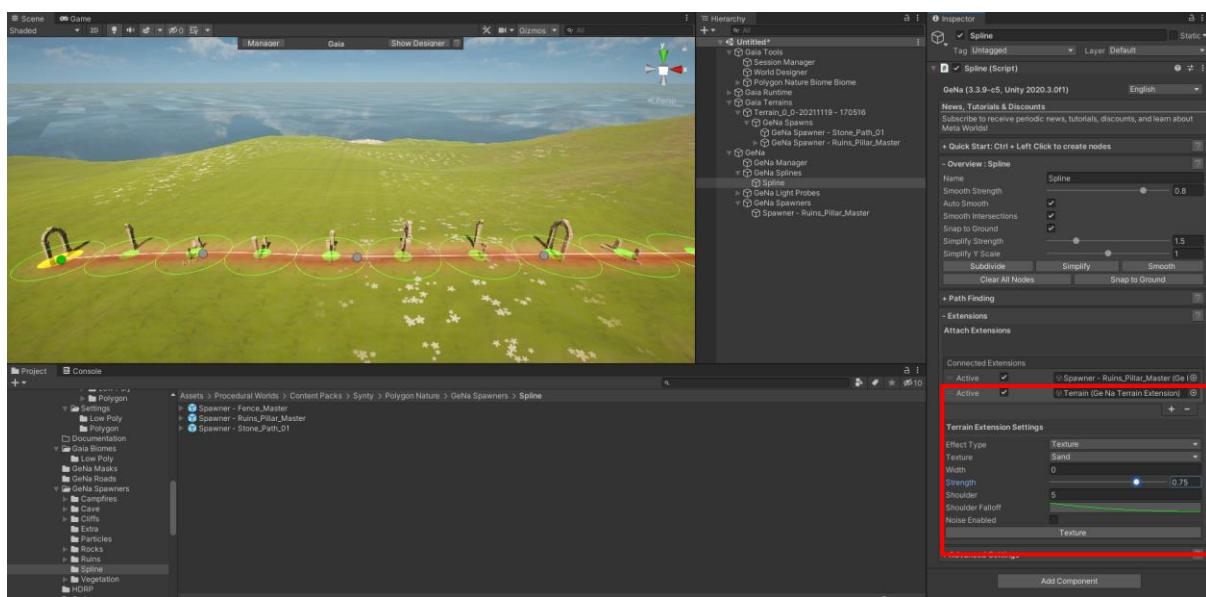
Check the “Align To Spline” and “Align Children” option to make the pillars align with the direction of the spline:

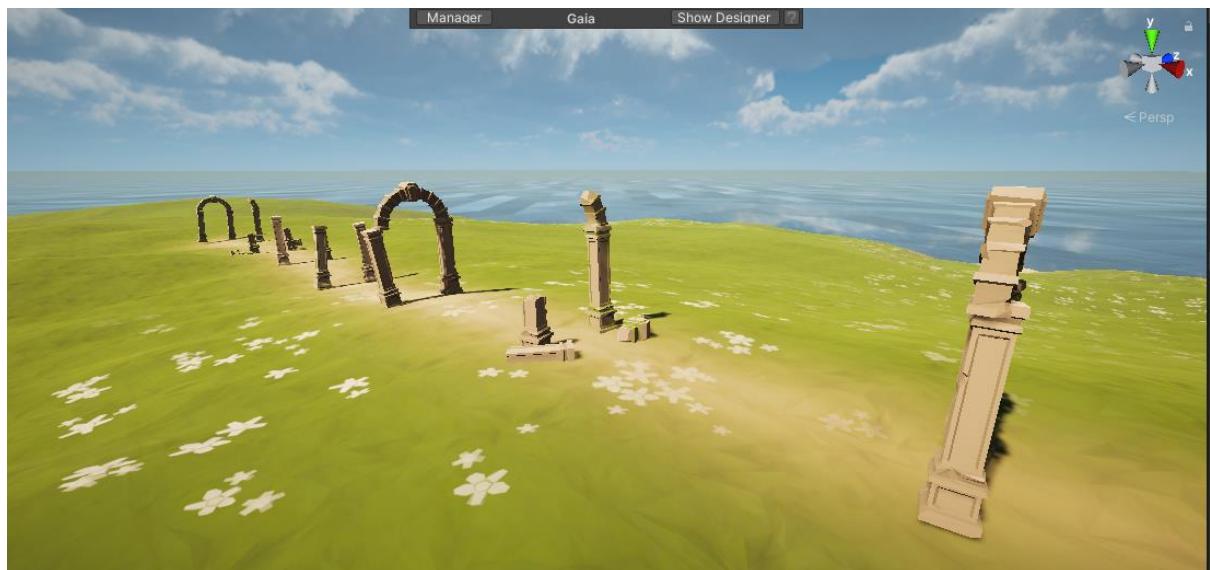


You can iterate the random look of the pillars using the “Iterate” button:



You can add in a texture spawner to spawn texturing along the pillars to give the impression that there is a dirt track path that leads through the pillars:



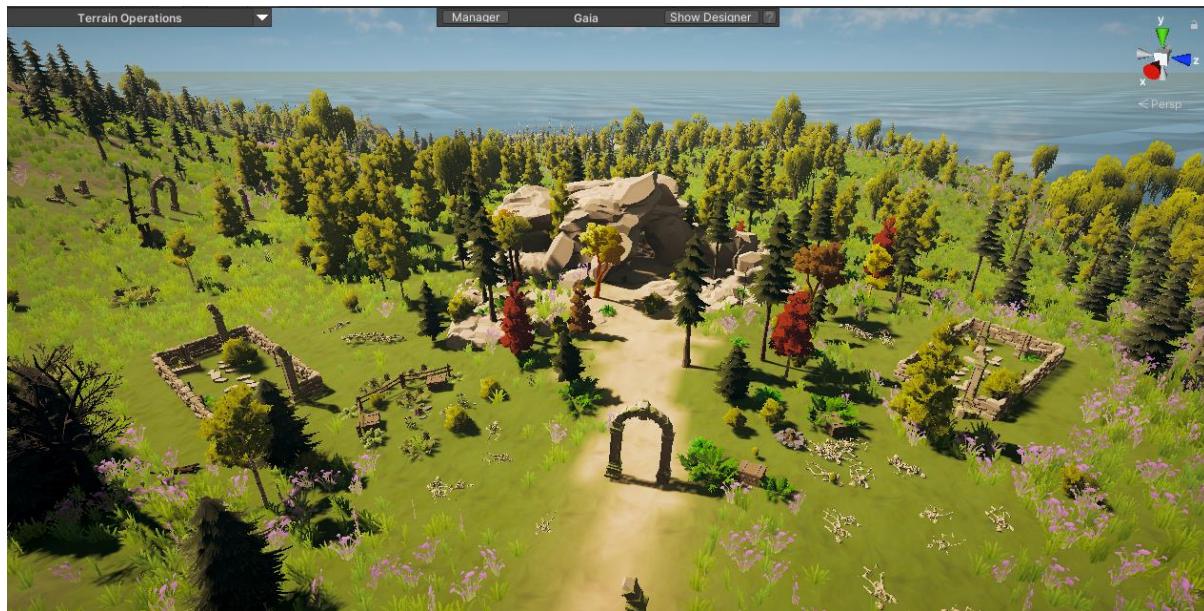
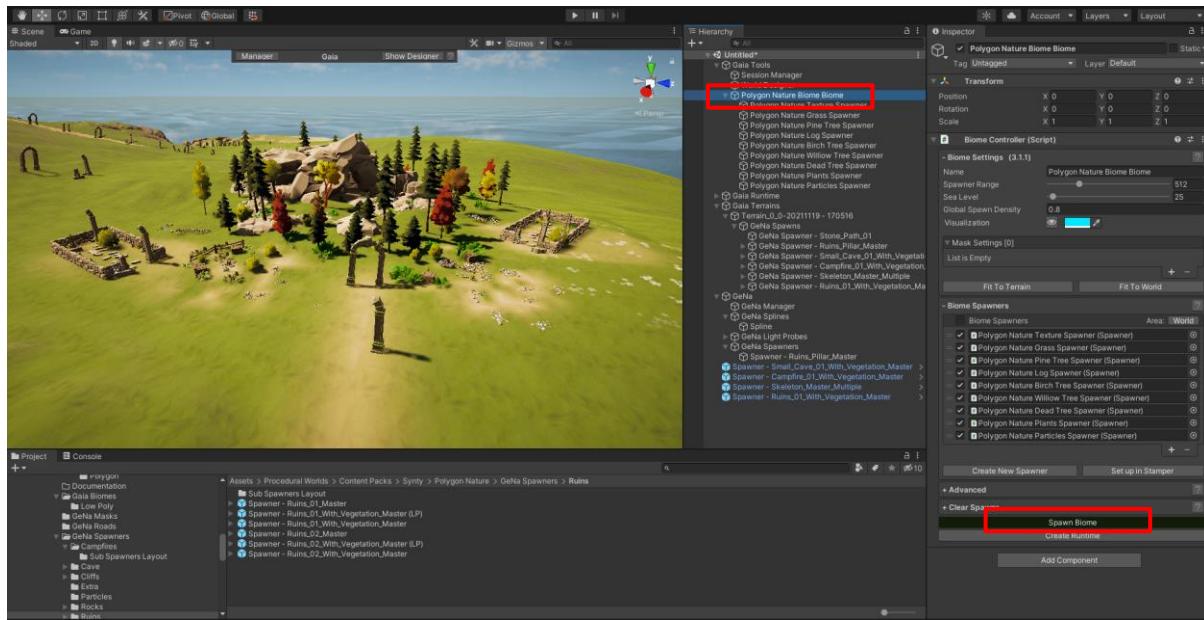


## API Based Runtime Spawning

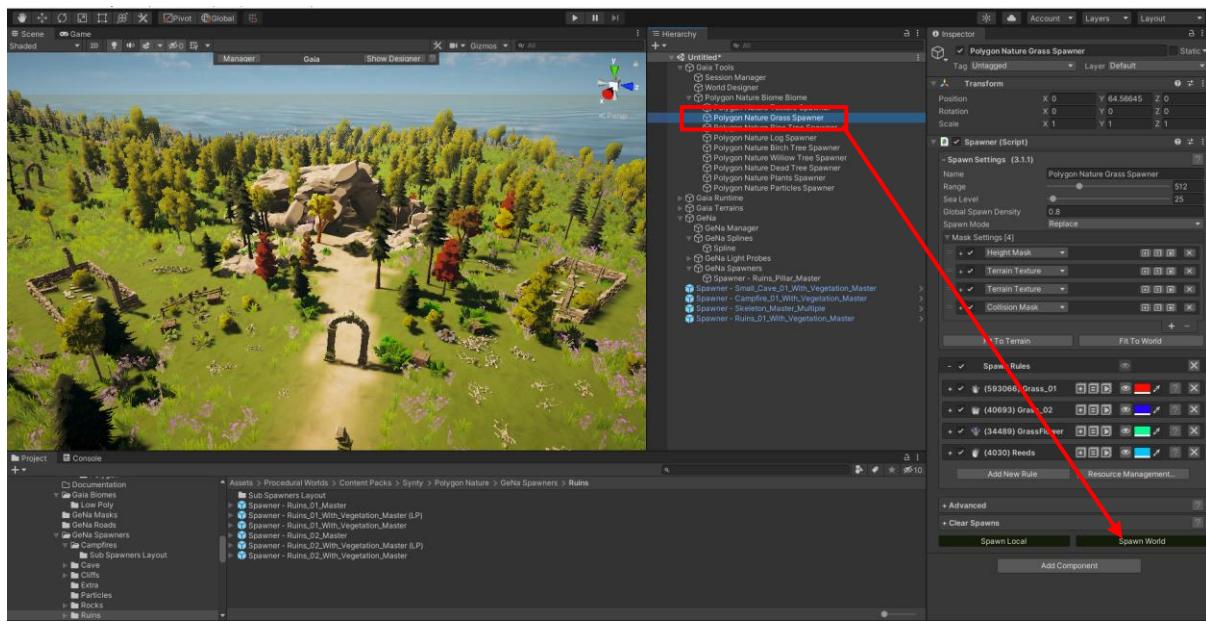
GeNa Pro can be controlled via API to spawn at runtime. Please check out the GeNa Pro documentation to learn more.

## World Finalization with Gaia Pro

In some scenarios you will want to use Gaia Pro to finalize your world. This will fill out all the areas you did not design yourself with GeNa & other tools. To do this select your biome under Gaia Tools and hit Spawn Biome.



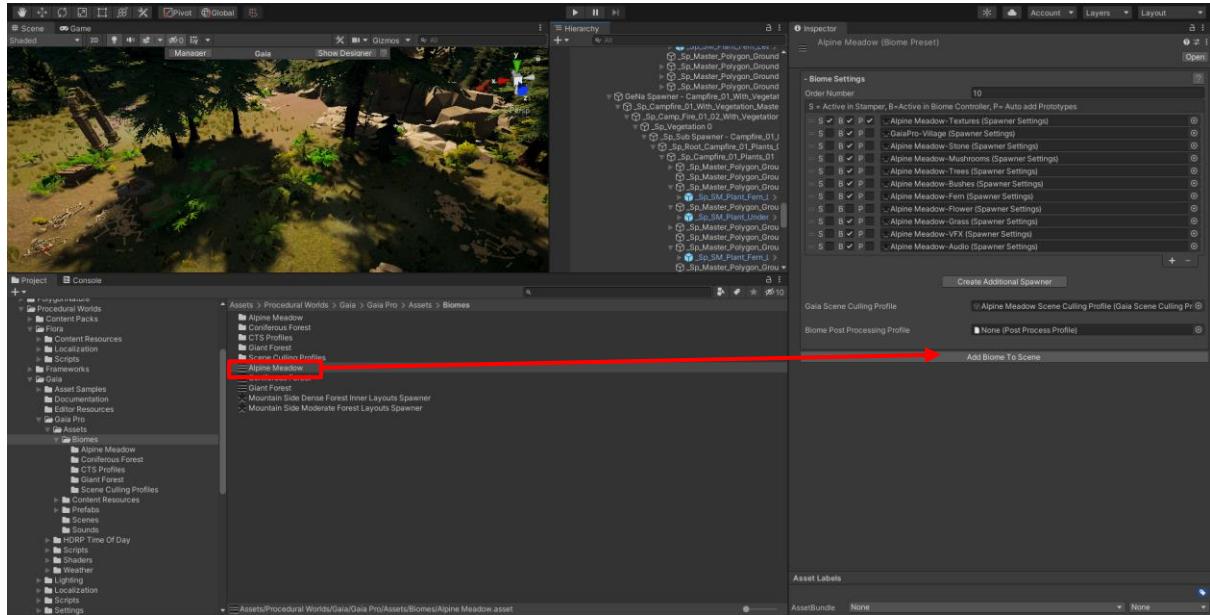
You can open out the individual biome spawners and just spawn the ones you want if you would prefer this instead of all of them.



It is also rather fun to mix and match styles! Here is the more realistic Gaia Alpine Biome mixed in with the assets from the Nature Pack:



NOTE: You can add Gaia biomes to your scene at any time by selecting the biome and then clicking ‘Add Biome To Scene’.



## Mesh Based Terrain Generation

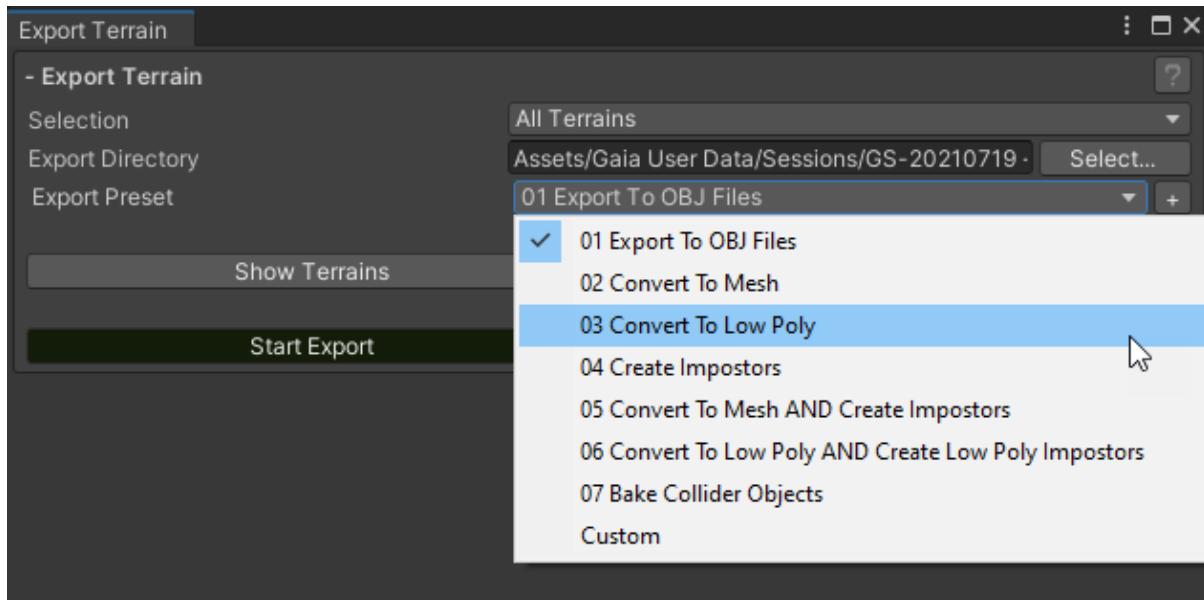
A powerful capability of Gaia Pro 2021 is its ability to convert your Unity terrain to a mesh and then to remove the original terrain completely.

The upside of this is that meshes are generally much faster than Unity terrain, but you also lose the ability to render unity terrain grass and terrain trees.

This would typically be done as one of the last things you do before finalizing your scene, as the GeNa spawners can flatten Unity terrain, but not flatten meshes (e.g., under buildings).

To convert your terrain to a mesh terrain, or a low poly mesh terrain.

1. Open Gaia Manager
2. Select Advanced Tab
3. Select Gaia Tools Foldout
4. Click on Terrain Mesh Exporter button.
5. Choose the option you want e.g., Low Poly Mesh.
6. Start the Export.



Here is an example low poly mesh export:



## Scene Finalization

When you are finished creating your scene the following things can reduce the size of your build.

1. Remove Gaia Tools. They are used only for creating environments.
2. Bake and then remove all your GeNa splines.
3. Delete your GeNa spawners.

## Spawner Examples

(A few of many variations obtained by iterating on the spawner using Shift+Ctrl+I)

### Campfires



### Caves

(hold shift and click to determine where the entrance should point before spawning!)



### Cliffs

(best used on a location with “natural” cliffs / steep areas)



### Rocks

(many variations and sizes of rock spawners exist)



## Ruins



## Vegetation

(Many different sizes and variants exist, also spawners for specific sorts of trees.)



## Gaia Pro Biome Examples

### Polygon Nature Biome



### Polygon Nature Biome (Low Poly)



