

MICRO BIOMES - FIELDS OF COLOR

By Procedural Worlds

Micro Biomes - Fields of Color is a collection of flower and shrub assets, including GeNa Pro and Gaia Pro compatible spawners.

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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](#)

Micro Biomes – Carefully curated asset collections that can be used with Gaia and GeNa with strong focus on a certain aspect of real world terrains – fields of flowers, muddy swamps, etc.

Micro Biomes – Fields of Colors (this asset)

Subscribe to our newsletter on our website: <https://www.procedural-worlds.com/>

Introduction

Thanks for purchasing the MicroBiomes Fields of Color!

The MicroBiomes Fields of Color pack helps you to enrich your environments with colorful blooming flowers – a great addition to any outdoor scene.

This pack contains both the asset files for the flowers as well as ready made configurations for our tools Gaia and GeNa so you can bring those flowers on your terrain quickly.

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 on our website](#).

Installation

If you wish to use this pack with GeNa Spawners, ensure you install the following:

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

If you wish to use this pack with Gaia Biomes, ensure you install the following:

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

You can install the assets in any order.

Then install the MicroBiomes Fields of Color Pack from Procedural Worlds. It will be installed into the following directories.

Procedural Worlds

 Micro Biomes

 Fields Of Color

 Content Resources: The meshes, textures, materials etc. used to build the assets.

 Demo Scenes: Showcase demo scenes for all rendering pipelines so you can get a quick overview over the assets contained in this pack.

 Documentation: Contains this document

 Flora: Ready-made presets for the Flora system (Gaia Pro's terrain detail rendering system)

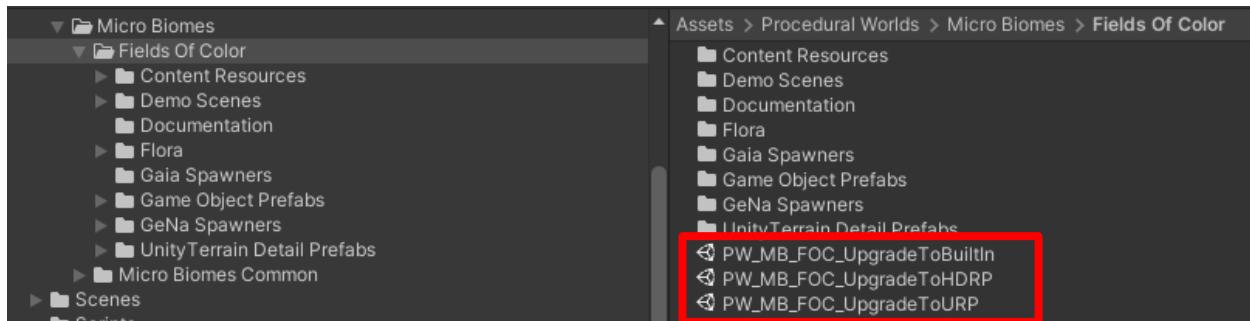
 Gaia Spawners: Gaia spawners to enrich existing biomes with the Fields of Color assets

 Game Object Prefabs: Regular prefabs intended to be used as Game Objects in the scene.

GeNa: Gena spawners to quickly spawn the Fields of Color assets with GeNa
Unity Terrain Detail Prefabs: Prefabs intended to be used with Unity's GPU instancing Mesh terrain system (Unity 2021.2 or higher)

Render pipeline support

Note: When installing into URP or HDRP you will also need to install additional packages for rendering pipeline support. The MicroBiomes Fields of Color asset comes with an installation pack for BuiltIn, URP and HDRP. It can be found at the root of the installation folder here:



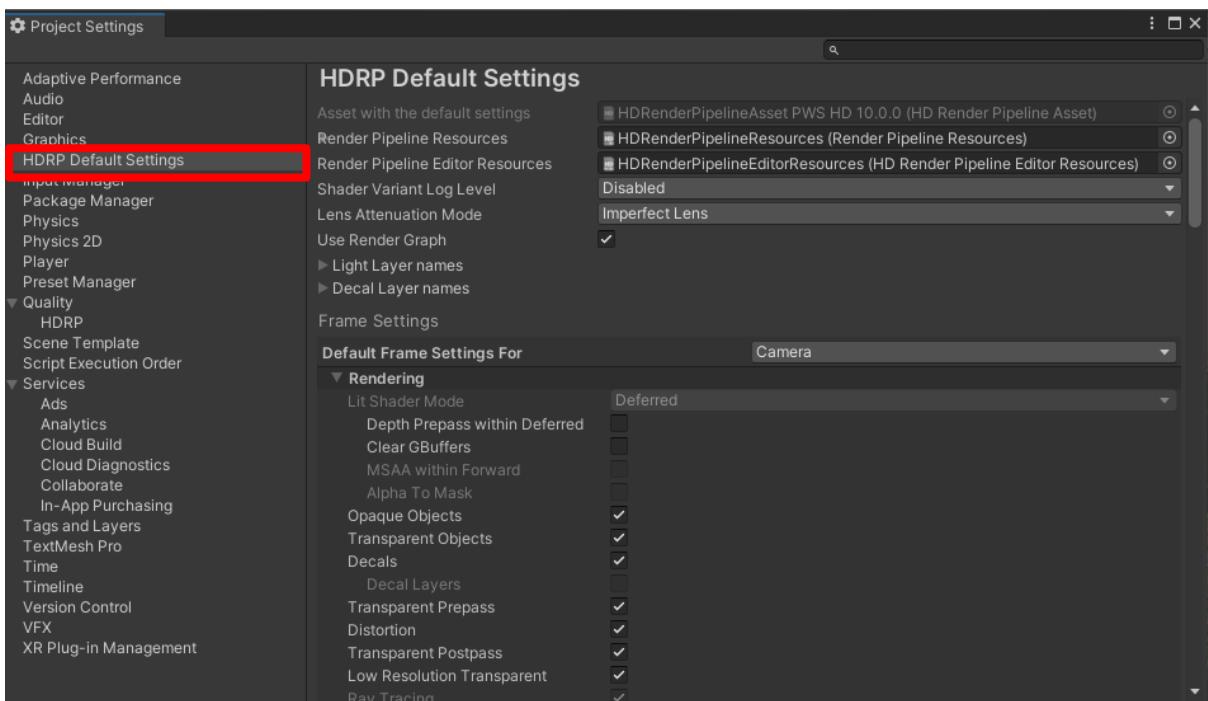
To install these files, simply double click them and they will extract their contents over the existing MicroBiomes Fields of Color asset, making it compatible with the respective pipeline.

HDRP

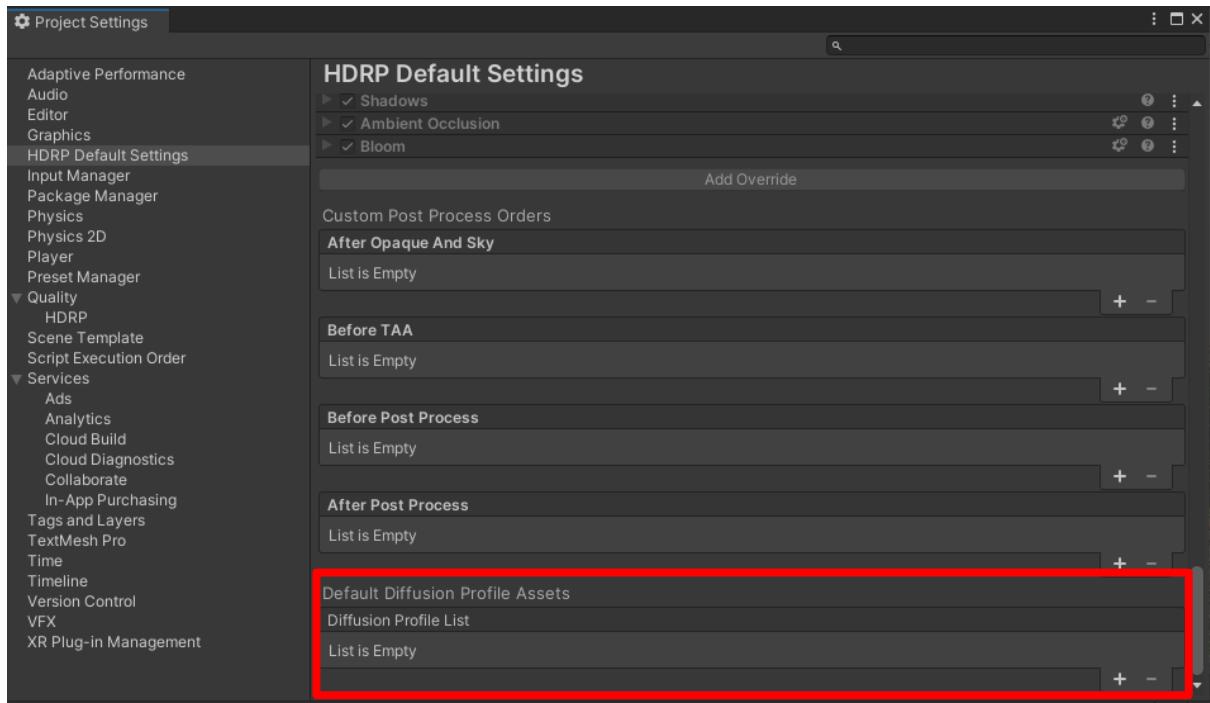
Install the package PW_MB_FOC_UpgradeToHDRP, located in Procedural Worlds -> Micro Biomes -> Fields Of Color. You may notice that some assets have a green sub surface tint to them, this is caused by the diffusion profile not being present in the HDRP default settings.



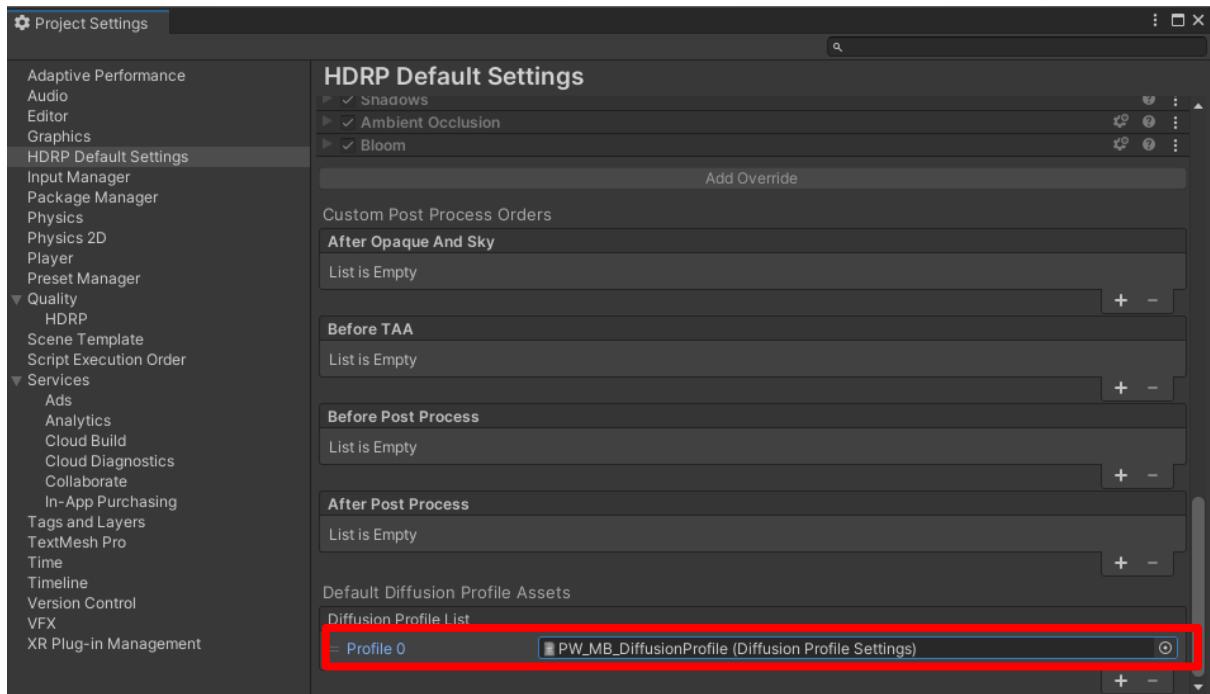
To fix this, navigate to the HDRP Default Settings located in Edit -> Project Settings -> HDRP Default Settings, or if you are using Unity 2021 and above, it is in Edit -> Project Settings -> HDRP Global Settings.



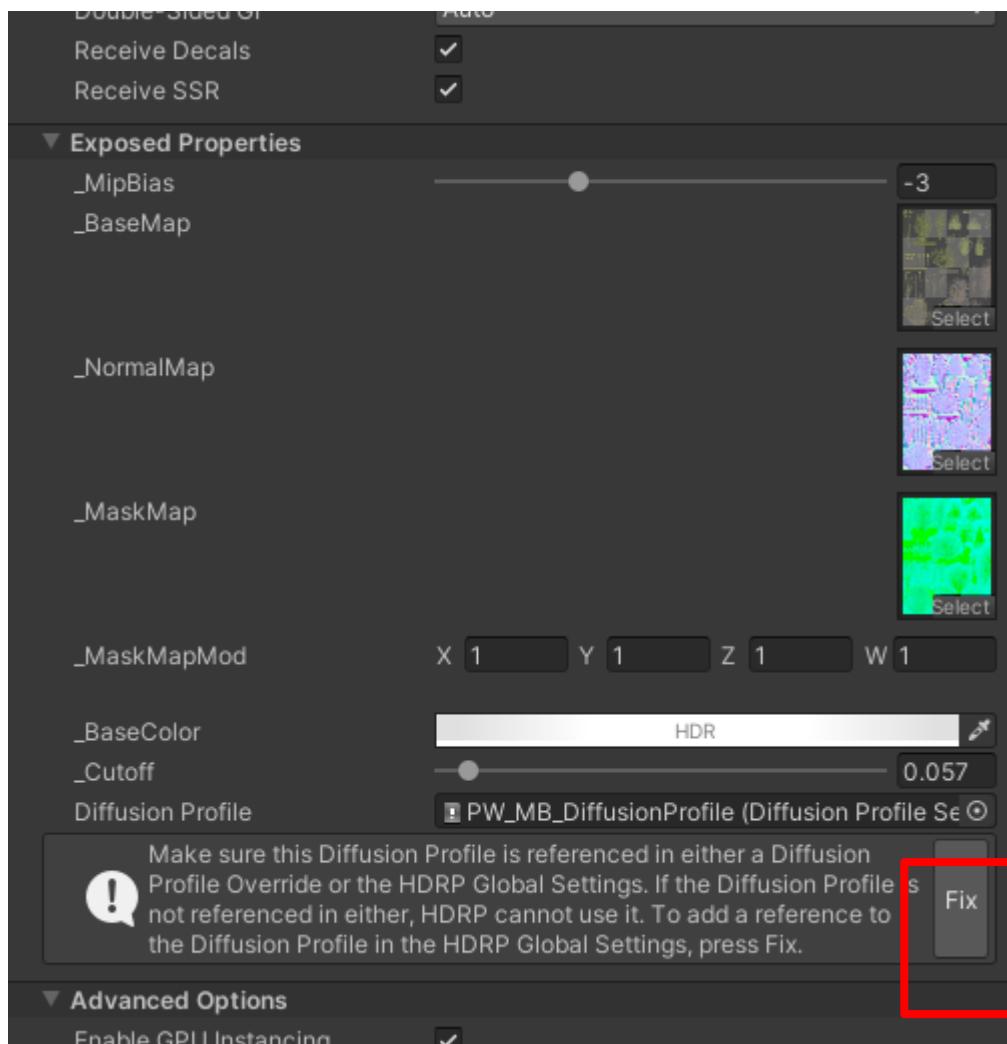
Scroll to the bottom of the page to find the Default Diffusion Profile Assets. Depending on your project, some diffusion profiles may already be present.



Press the plus icon and add the MicroBiomes diffusion profile, located in Procedural Worlds
-> Micro Biomes -> Micro Biomes Common->Settings->PW_MB_DiffusionProfile.



The same process can be automatically performed by Unity after installing the upgrade package and selecting any of the materials located in Procedural Worlds -> MicroBiomes -> Fields of Color -> Content Resources -> Materials. If the warning message is displayed about the diffusion profile, press the Fix button.



URP

To update to URP, install the package PW_MB_FOC_UpgradeToURP, located in Procedural Worlds -> Micro Biomes -> Fields Of Color.

Returning to Built-In-Rendering

To update / return back to built-in rendering, install the package PW_MB_FOC_UpgradeToBuiltIn, located in Procedural Worlds -> Micro Biomes -> Fields Of Color.

Tutorials, Chat, Ticketed Support

Community Discord: <https://discord.gg/Tggi0NN>

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 MicroBiomes Fields of Color

Background – Displaying Vegetation in Unity

If you have already created a terrain in unity, or used the Procedural Worlds Tools, you might be aware that there are different options that Unity offers to display vegetation on the terrain. You can in theory use all these options to display the assets in this pack on your terrain. These options have different advantages / disadvantages to them, so it is good to understand the technical background first, before we explain how you can use the assets in the given method.

Using as Prefab / Game Object

You can just take the prefab of the tree / plant you want to display on your terrain and drag it in the scene. This object is then no different than any other regular Game Object in the scene.

Positive:

- Full control over the game object, can run any component on it
- Full control over navmesh baking
- Can be used anywhere (mesh terrains!), no unity terrain required
- Can use any shader
- Easier interactivity (harvesting, physics etc.)
- Complex colliders allowed
- Easier to find and reference a specific vegetation item
- Easy to move / rotate items, just use the regular transform controls
- LOD Support

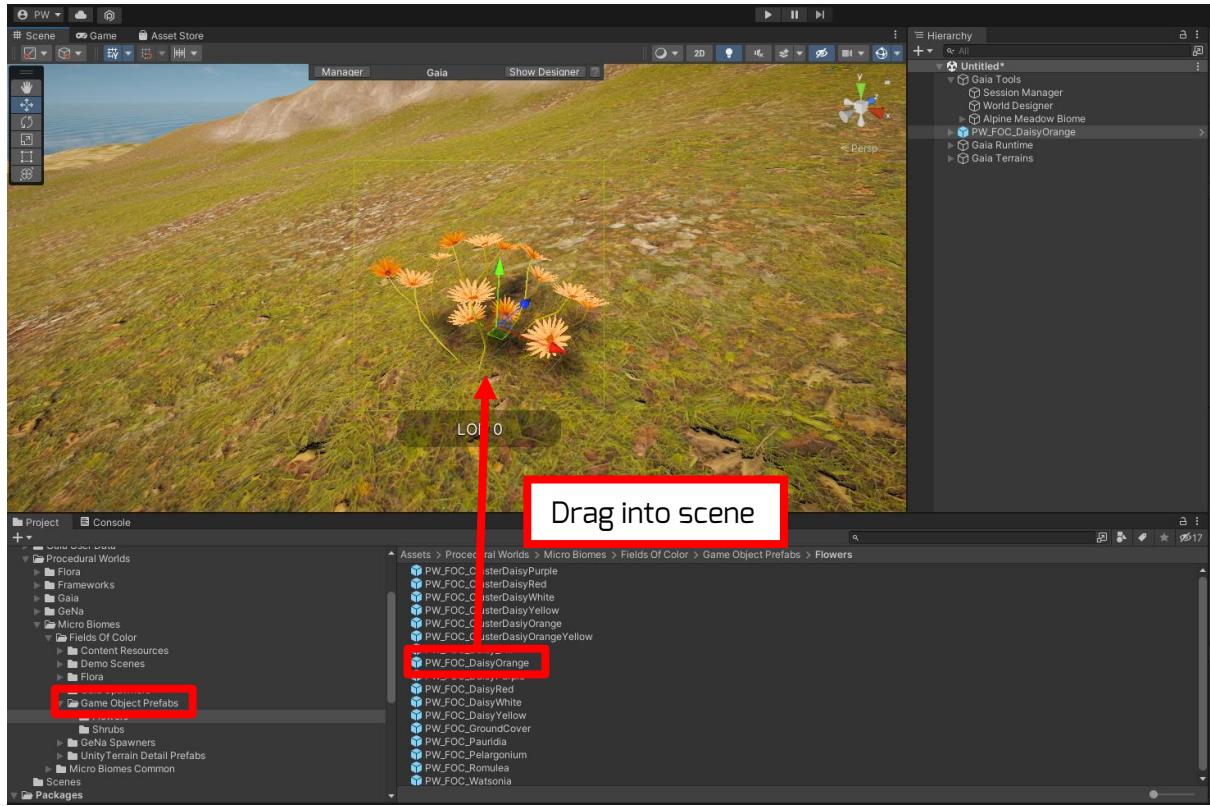
Negative:

- Tedious mass placement (without additional tools)
- Slow, not optimized for mass rendering
- Difficult to swap out prefabs / models (without additional tools)

Use case: Placement of only a few vegetation items, or when full interactivity is required.

How to use the assets in this pack as Game Object:

You can find prefabs for all the assets in the “Game Object Prefabs” folder. Select one of the prefabs in there and drag and drop it in the scene.



You can of course use these prefabs in any tool for Game Object spawning as well (Gaia, GeNa, etc.) Note that this pack contains ready-made GeNa spawners already.

Using as Terrain Tree

You can take the prefab of the tree / plant you want to display on your terrain and use it in the [Unity Terrain Tree system](#). Unity does not allow all components on these prefabs though, e.g. complex colliders are not allowed, and scripts will be removed. The colliders of the trees will be baked into one common collider together with the terrain. Note also that a “tree” does not necessarily have to be a tree semantic-wise – no one is stopping you from adding a flower prefab or a rock to the tree system.

Positive:

- Easier placement and removal, trees can be painted on the terrain with a brush
- Better performance through optimization
- Easier to swap out tree prefabs
- LOD support
- Trees drawing distance / billboard stage can be controlled with one common slider from the terrain inspector

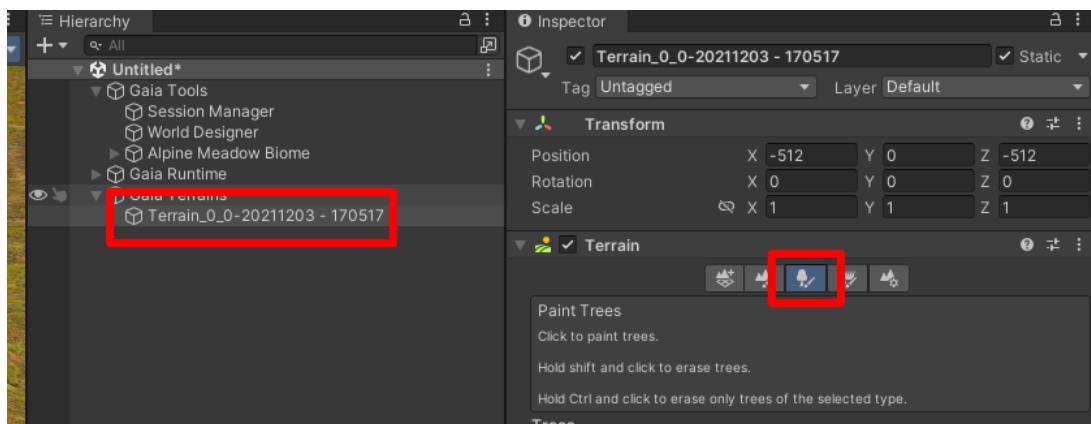
Negative:

- No complex colliders
- Reduced control over navmesh baking, per default all trees will be baked in the navmesh, need to employ workarounds to avoid that.
- Interactivity more difficult
- Difficult to get a reference to a single tree
- Not having a LOD group can lead to issues
- Only works on Unity Terrain

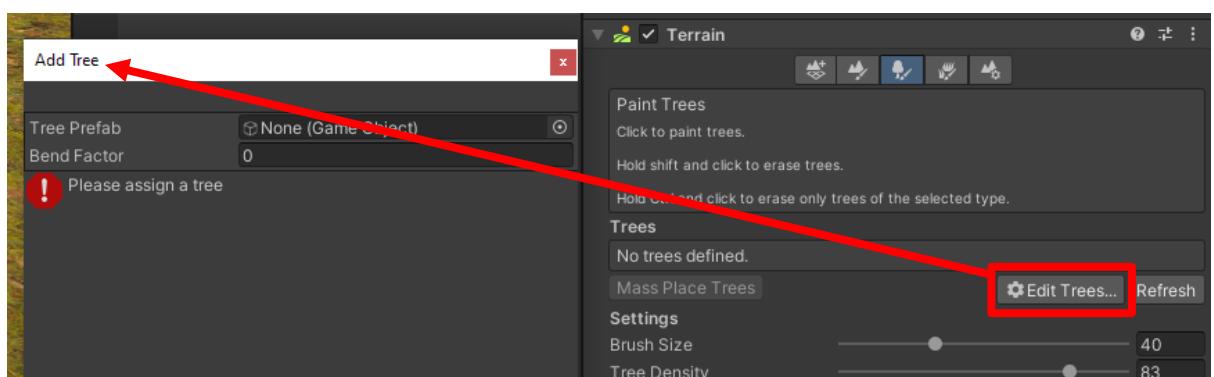
Use case: Mass rendering of larger vegetation items with LOD support, where interactivity is less of a concern. Might also be an alternative to use in Unity versions lower than 2021.2 or if Gaia/Flora is not available.

How to use the assets in this pack as terrain trees:

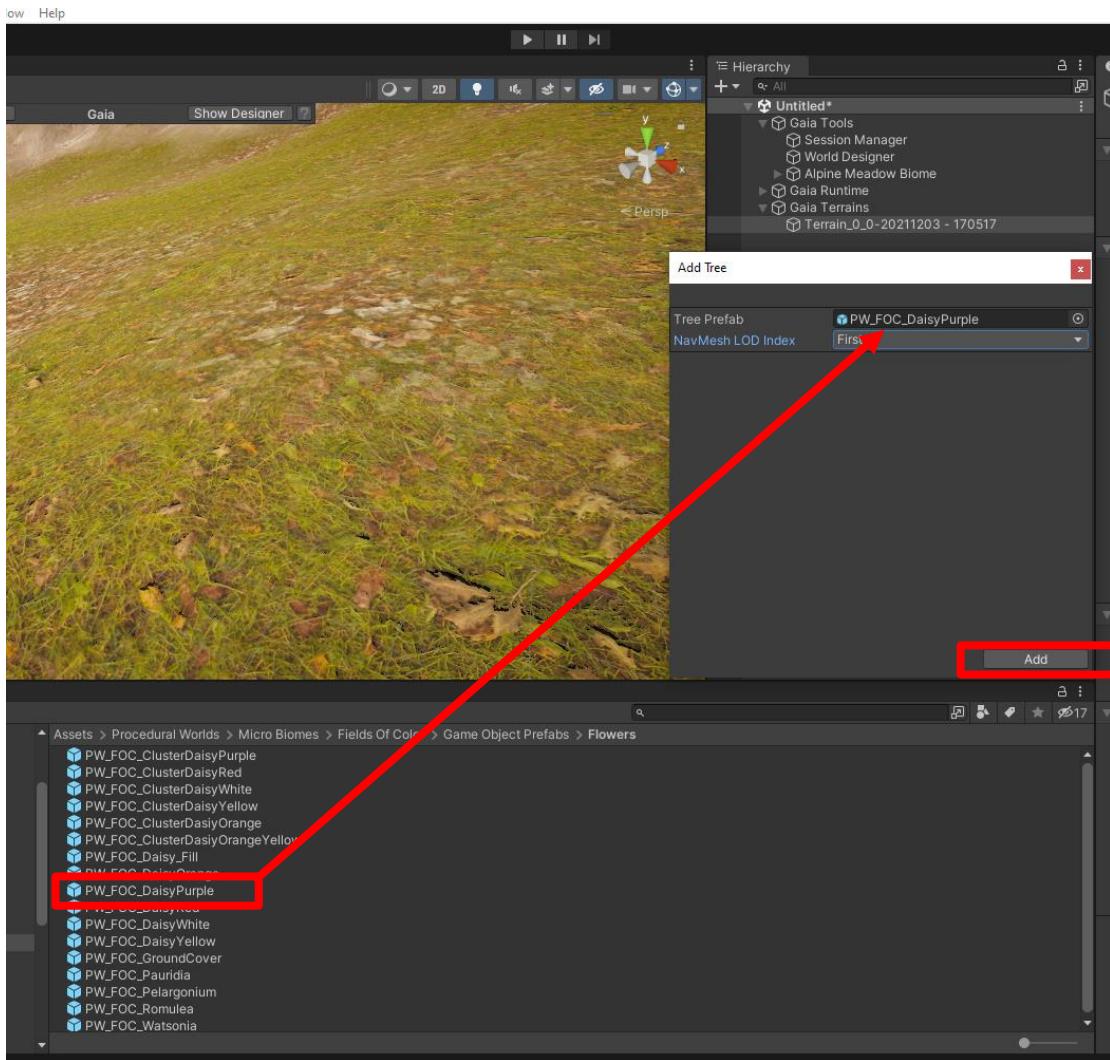
1. Select the terrain and the “Paint Trees” mode



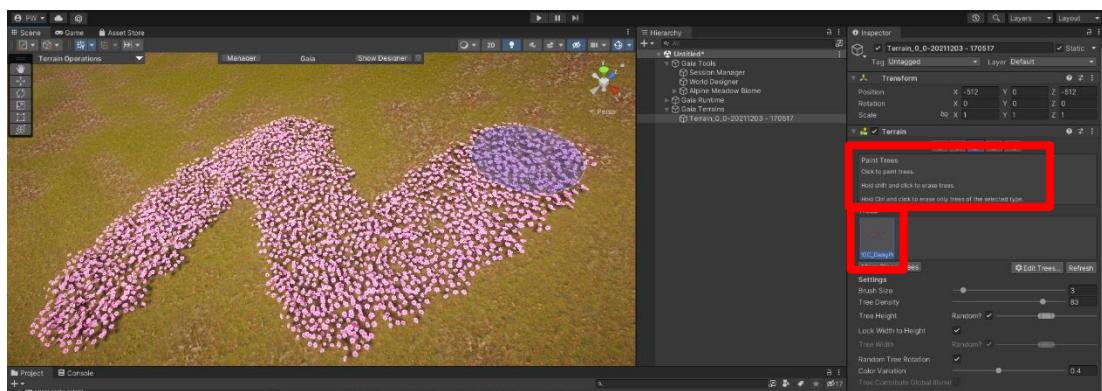
2. Add a new tree via “Edit Trees > Add Tree...”



3. In the tree prefab selection window, select one of the prefabs found in the “Game Object Prefabs” folder into the slot, and click the “Add” button.



- Now you can paint on the prefab as a terrain tree with the terrain tree paint brush in the inspector:



You can of course set up the object as a tree and spawn it as tree in another Spawning tool as well. (Gaia, GeNa)

Using in the Terrain Detail System

Unity has a [terrain detail system](#) in place for efficient mass rendering of small detail (a “detail” can be grass, or e.g. sticks and stones) items without LOD support. However, you cannot simply stuff any prefab in this system and expect it to work. Here it gets a bit complicated, because different modes exist for this system, depending on the Unity version and rendering pipeline.

Before Unity 2021.2 you could supply a texture or a mesh for detail rendering, but were bound to Unity’s internal shaders (Billboard, Grass, Vertex Lit) for the rendering. Terrain Details in HDRP were not supported at all.

While it was possible to supply a mesh, results were often not very good because the internal shaders did not give very good results on those.

With Unity 2021.2, support for detail meshes has improved, and you can now supply a prefab with your own shader. GPU Instancing works (if the shader supports it). Mesh Terrain Details are now supported in HDRP.

Positive:

- Easier placement and removal, terrain details can be painted on the terrain with a brush
- Better control of density
- High performance due to GPU instancing (or mesh combining in older Unity versions)

Negative:

- No colliders
- No control over navmesh baking, terrain details will be ignored
- Interactivity can be difficult
- Impossible to get a reference to a single item
- No LOD support
- Shader needs to support GPU Instancing for good performance
- Only works on Unity Terrain

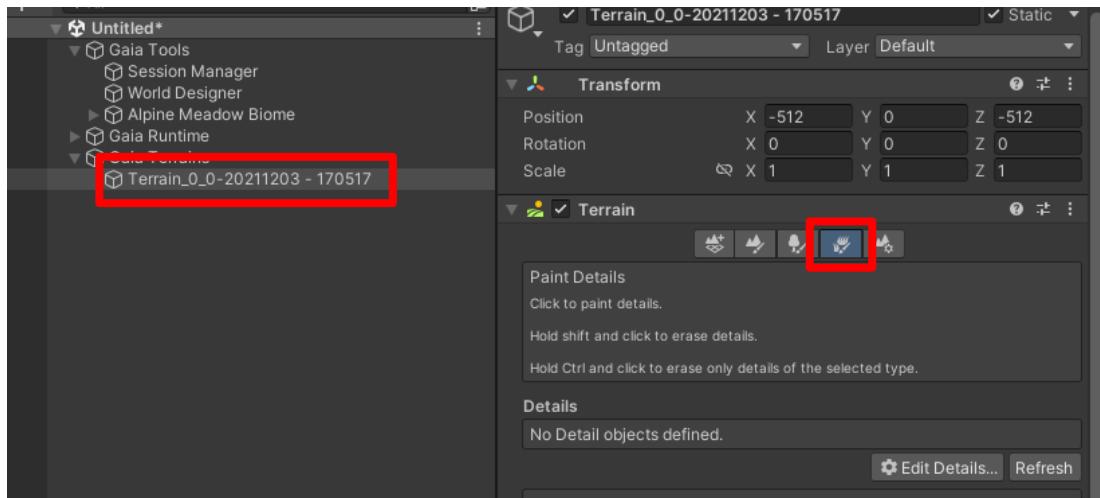
Use case: Mass rendering of small vegetation items like grass without LOD support, where interactivity is not required.

How to use the assets in this pack as terrain details:

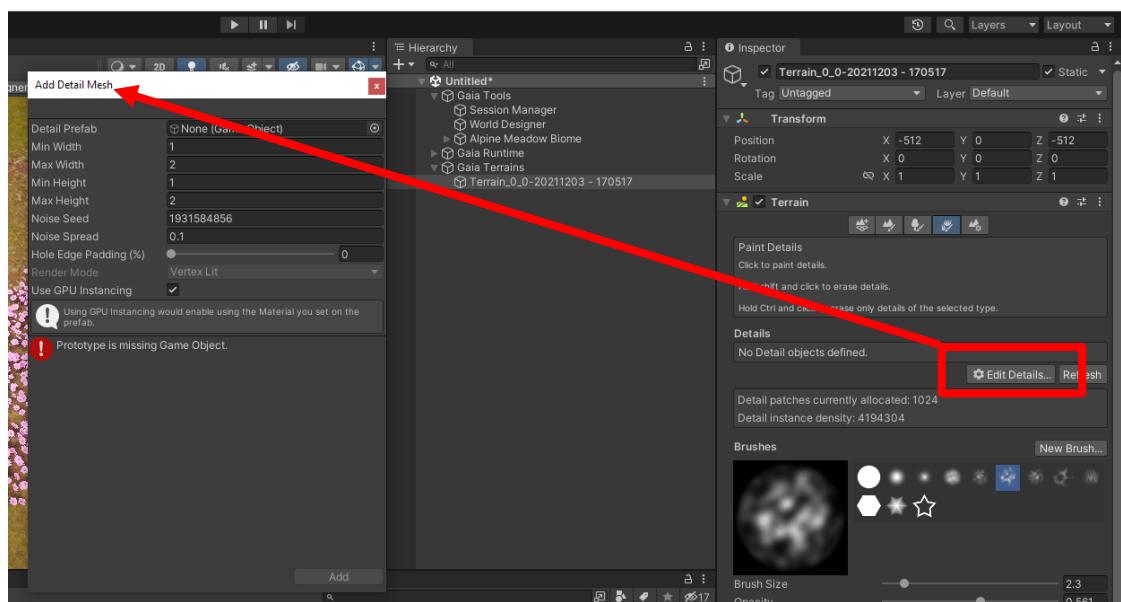
Please note: Using the terrain detail system requires Unity 2021.2 or higher! In lower

versions of Unity it is not possible to use the assets in this pack in a meaningful way within the Unity Terrain Detail system. In these lower versions you would need to stick to the other rendering methods (Game Object, Tree, Gaia's Flora system) or another 3rd party vegetation renderer.

1. Select the terrain and the “Paint Details” mode

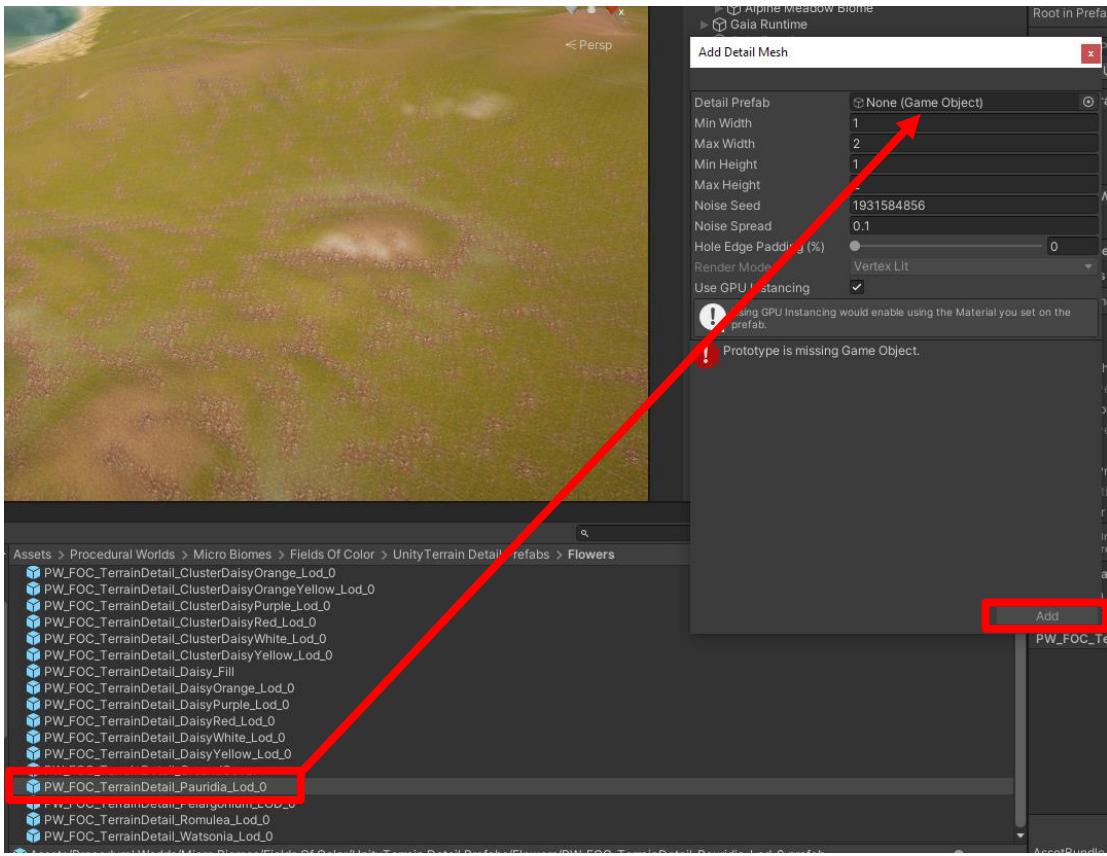


2. Add a new detail object via “Edit Details > Add Detail Mesh...”

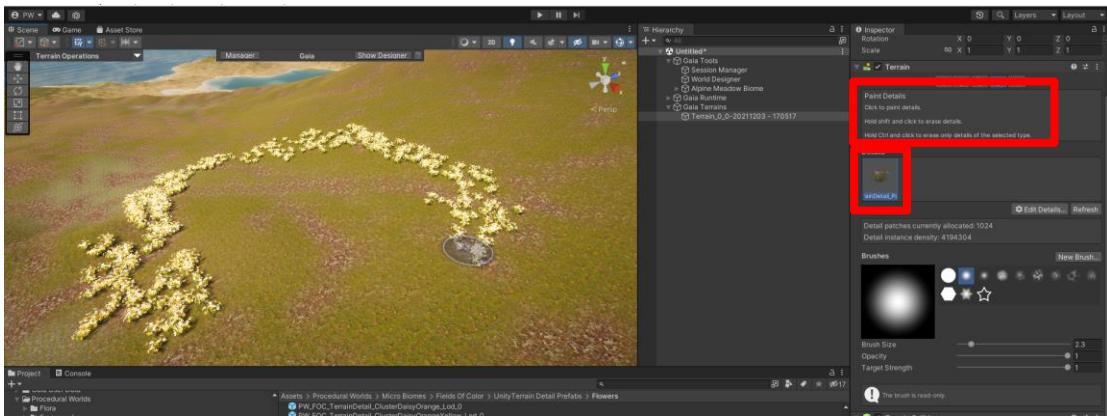


3. In the detail mesh prefab selection window, select one of the prefabs found in the “Unity Terrain Detail Prefabs” folder into the slot, and click the “Add” button.

Please Note: Do not pick a prefab from the regular “Game Object Prefabs” folder – these will not work in the terrain detail system!



- Now you can paint on the prefab as a terrain detail with the terrain detail paint brush in the inspector:



You can of course set up the object as a terrain detail and spawn it as such in another spawning tool as well. (Gaia, GeNa)

Please Note: You can find pre-configured Gaia spawners in the “Gaia spawners” directory that will spawn the object as terrain detail. Note however that the objects will then use Flora for rendering by default during runtime, if you do not want this, you would need to disable Flora in the spawn rules. The section “Spawning the assets with

Gaia (Pro)" has more information about this.

Please Note: The density of the vegetation in this mode depends on the "Terrain detail resolution" for the terrain, and the "Detail Density" slider found in the terrain settings.

Using in Flora (Gaia Pro's vegetation rendering system)

Since the abilities to render meshes in the earlier Unity Versions below 2021.2 were limited, Gaia Pro comes with an alternative method to render terrain details called Flora. The Gaia spawners included with this package are pre-configured to use Flora, which is why this method is explained here.

Flora takes the information about terrain detail placement from the unity system and uses this information to display instanced indirect rendered meshes on the terrain during runtime.

Positive:

- Compatible with the native terrain detail placement
- High performance due to GPU instanced indirect rendering
- Many additional options for rendering (color tinting, fade in / fade out, rotate to slope, etc.)
- Global control for range and density
- LOD support

Negative:

- Does not display during design time in the editor, run-time only
- Requires extensive setup
- No control over navmesh baking, Flora items will be ignored
- Using custom shaders currently requires shader knowledge
- (Currently) Only works on Unity Terrain (might change in the future)

How to use the assets in this pack in Gaia's Flora system:

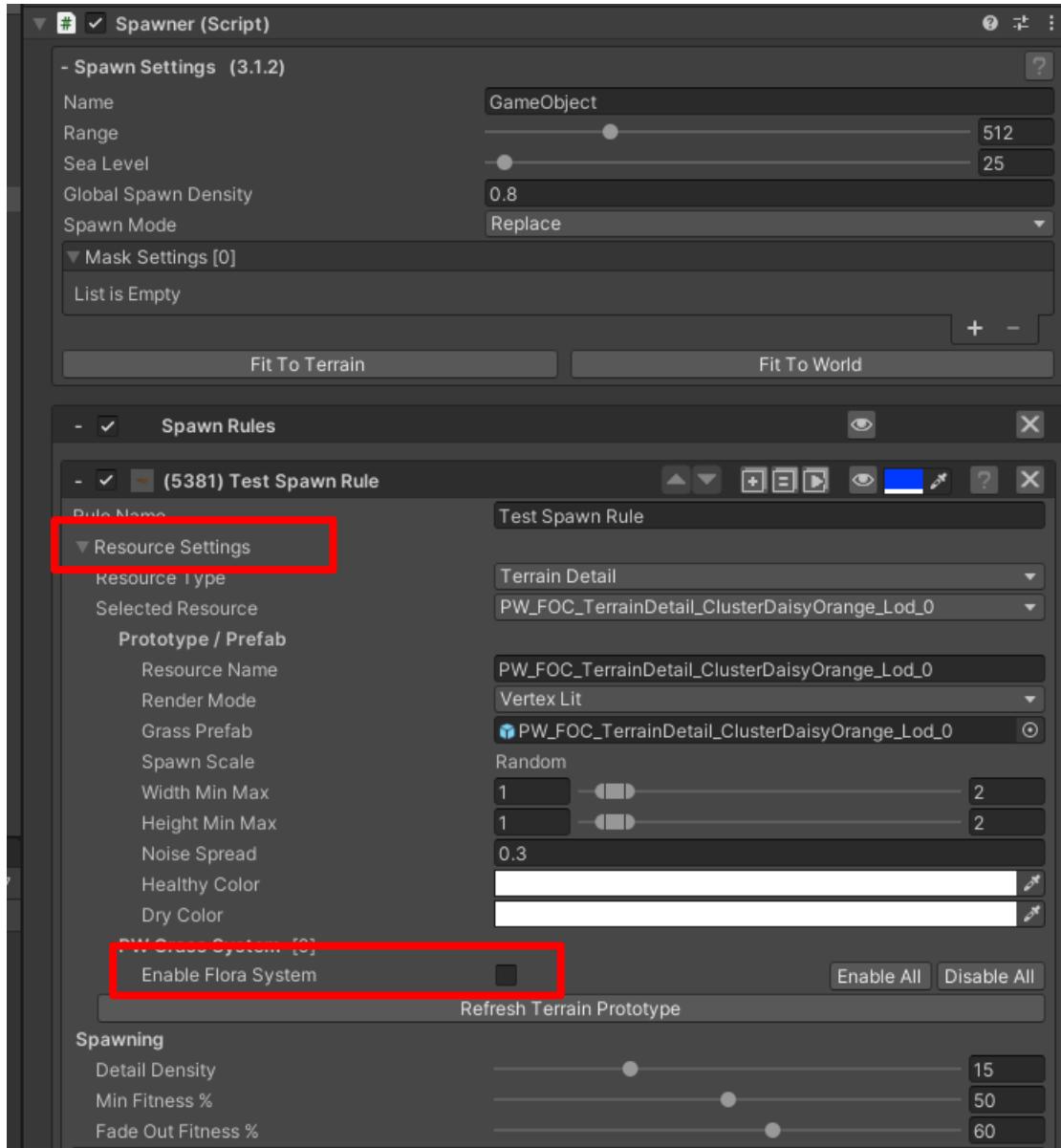
The easiest way is to use the pre-configured spawners that come with the pack in the "Gaia Spawners" folder. If you own Gaia Pro, all you need to do is to run those spawners and the vegetation items within will be rendered with Flora during runtime.

However, if you want to configure your own spawners to display the vegetation from the pack during runtime, that can be done as well with the following instructions.

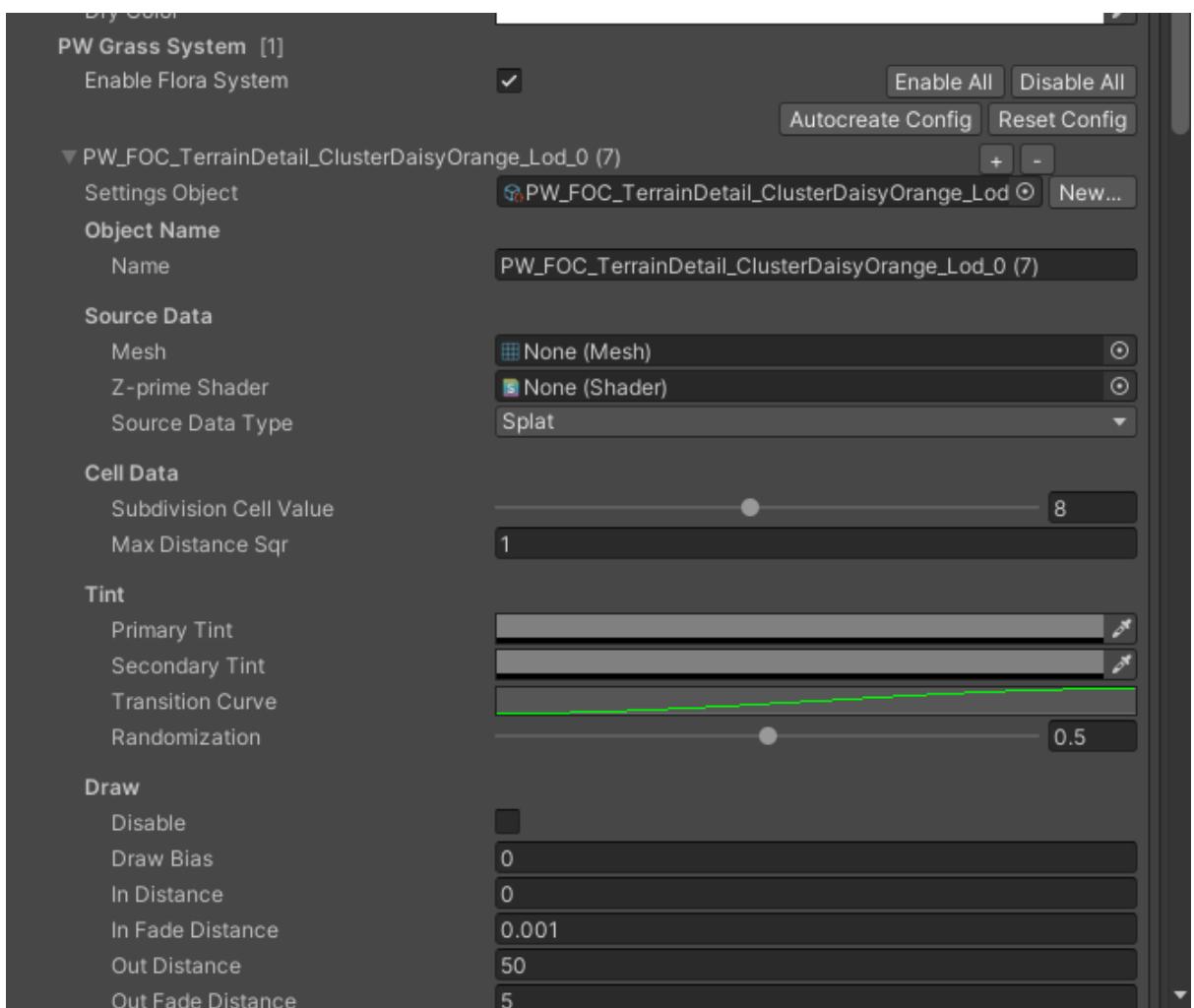
To use Flora in Gaia, you need to use a terrain detail spawn rule first. The spawned result of the terrain detail spawn rule is displayed during design time. If a Flora configuration

exists, Flora will then kick in during run time and take over the rendering of that terrain detail item based on the spawn result from that spawn rule.

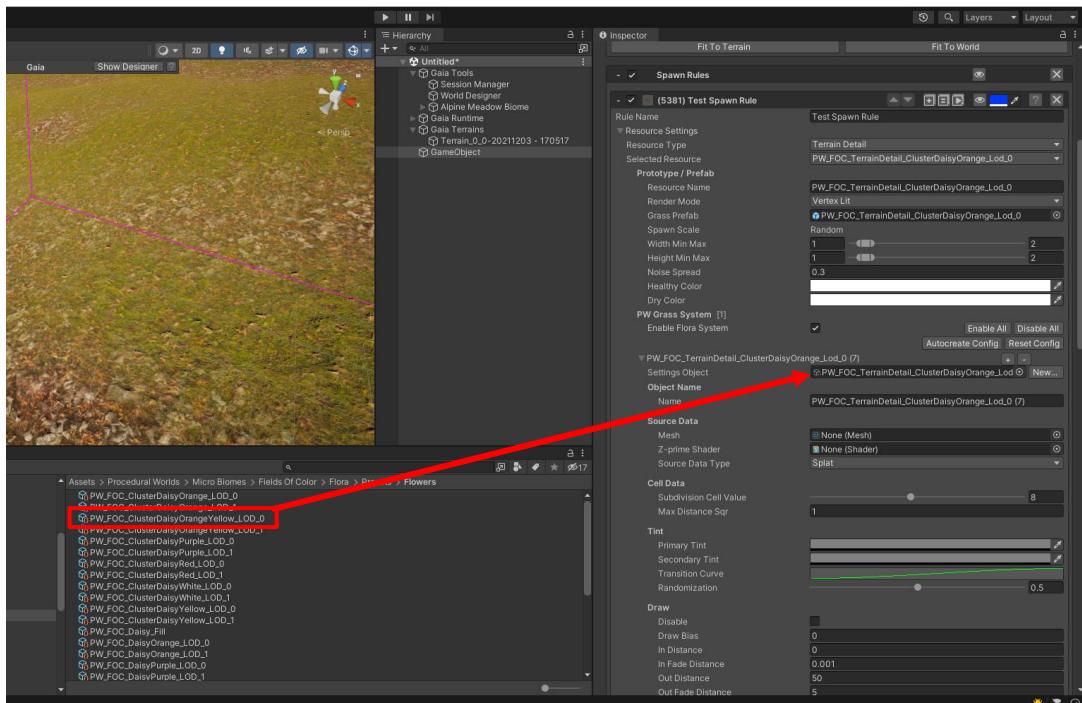
1. Open the Resource Settings in the spawn rule in which you want to use Flora:



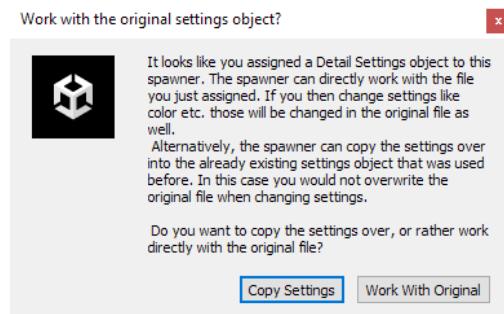
2. Click the checkbox for “Enable Flora System”. You should see a settings entry for the first LOD appearing. When you unfold this entry, you will see all the Flora settings for this LOD:



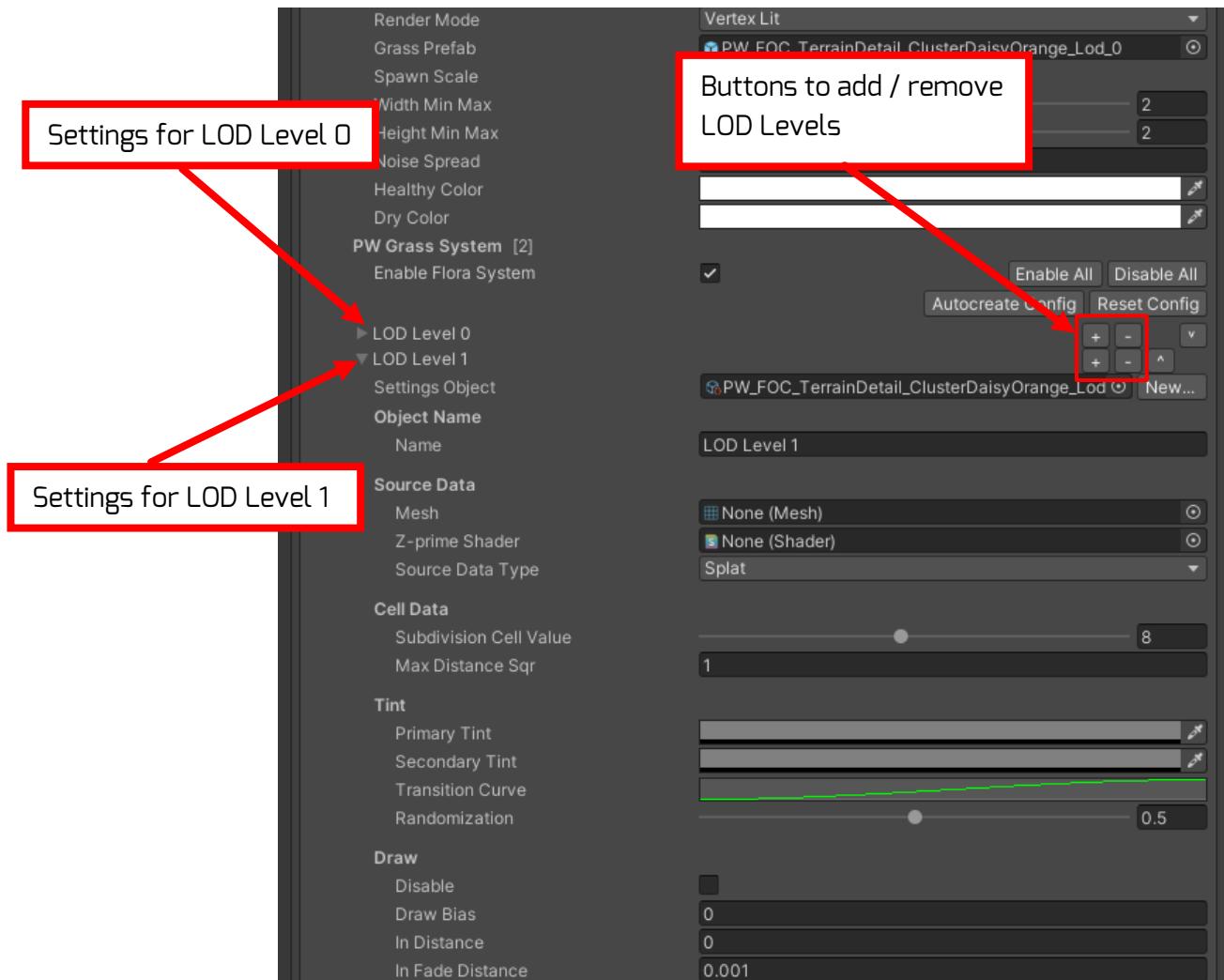
3. You do not need to configure all these settings manually, but you can use the preconfigured settings that come with this asset. To do so, look for the settings files stored under Flora\Presets in this asset. Drag and drop the settings file into the “Settings Object” slot in Gaia:



- When doing so, you will be asked if you want to create a copy of the settings file to work with, or if you want to overwrite the original file. It is recommended to work with a copy, unless you need to overwrite the original settings that came with the package installation.



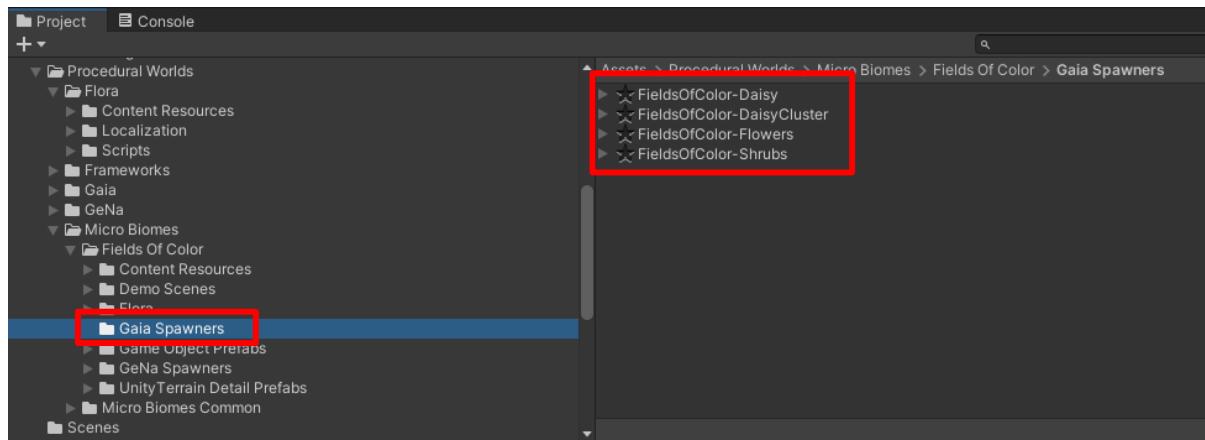
- All the settings for this LOD have been copied into the Gaia spawner. You can now add another LOD with the small "+" button on top where you unfold the LOD settings. For the 2nd LOD you can use the prepared config file from the pack as well:



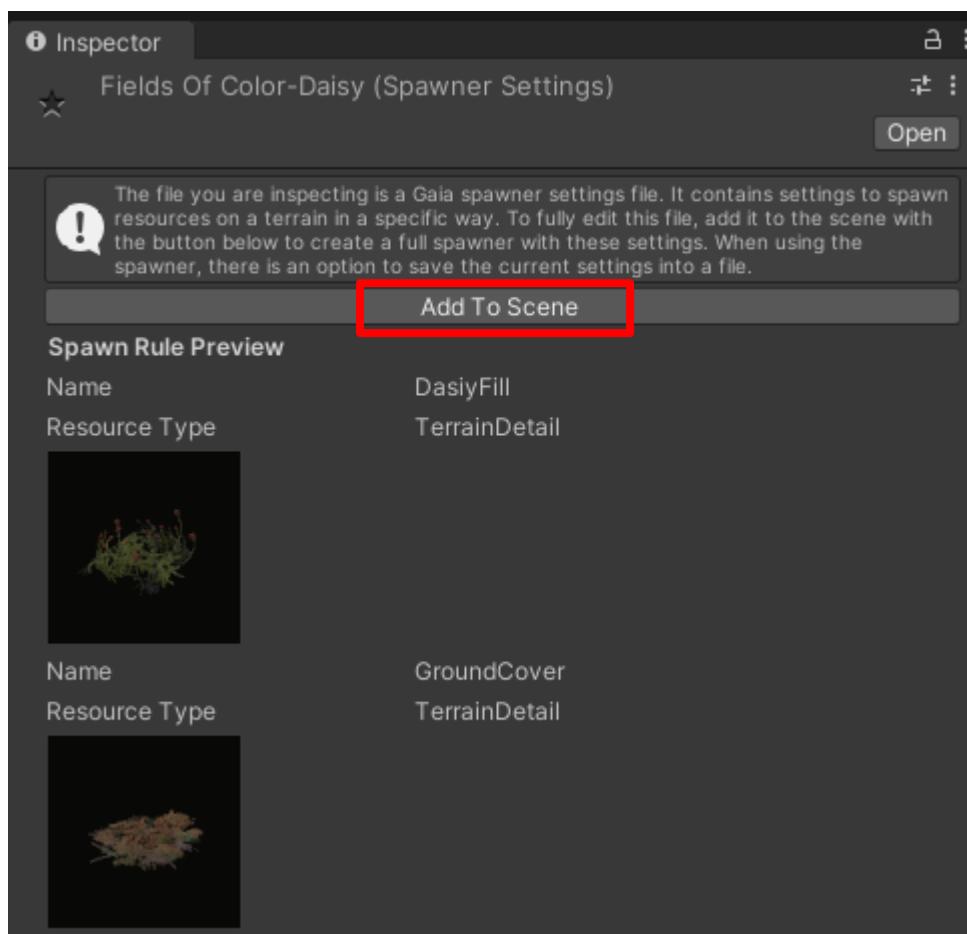
- With the Flora settings in place, you can run the spawner now. When a terrain detail item with Flora configuration is spawned on the terrain, Gaia will automatically add the required components to the scene to make it render during runtime as well.

Spawning the assets with Gaia (Pro)

To use the premade spawners for Gaia, navigate to their location in the project: Procedural Worlds -> Micro Biomes -> Fields Of Color -> Gaia Spawners



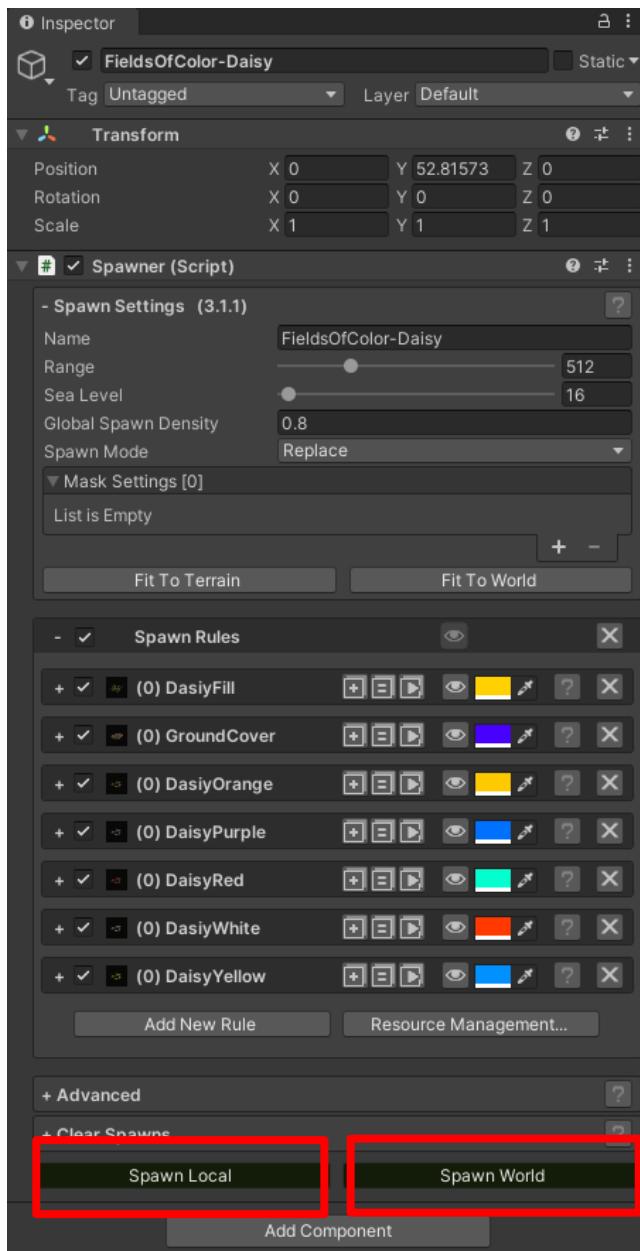
Press the 'Add To Scene' button to add the spawner to the scene.



This will now add the spawner game object in the hierarchy.



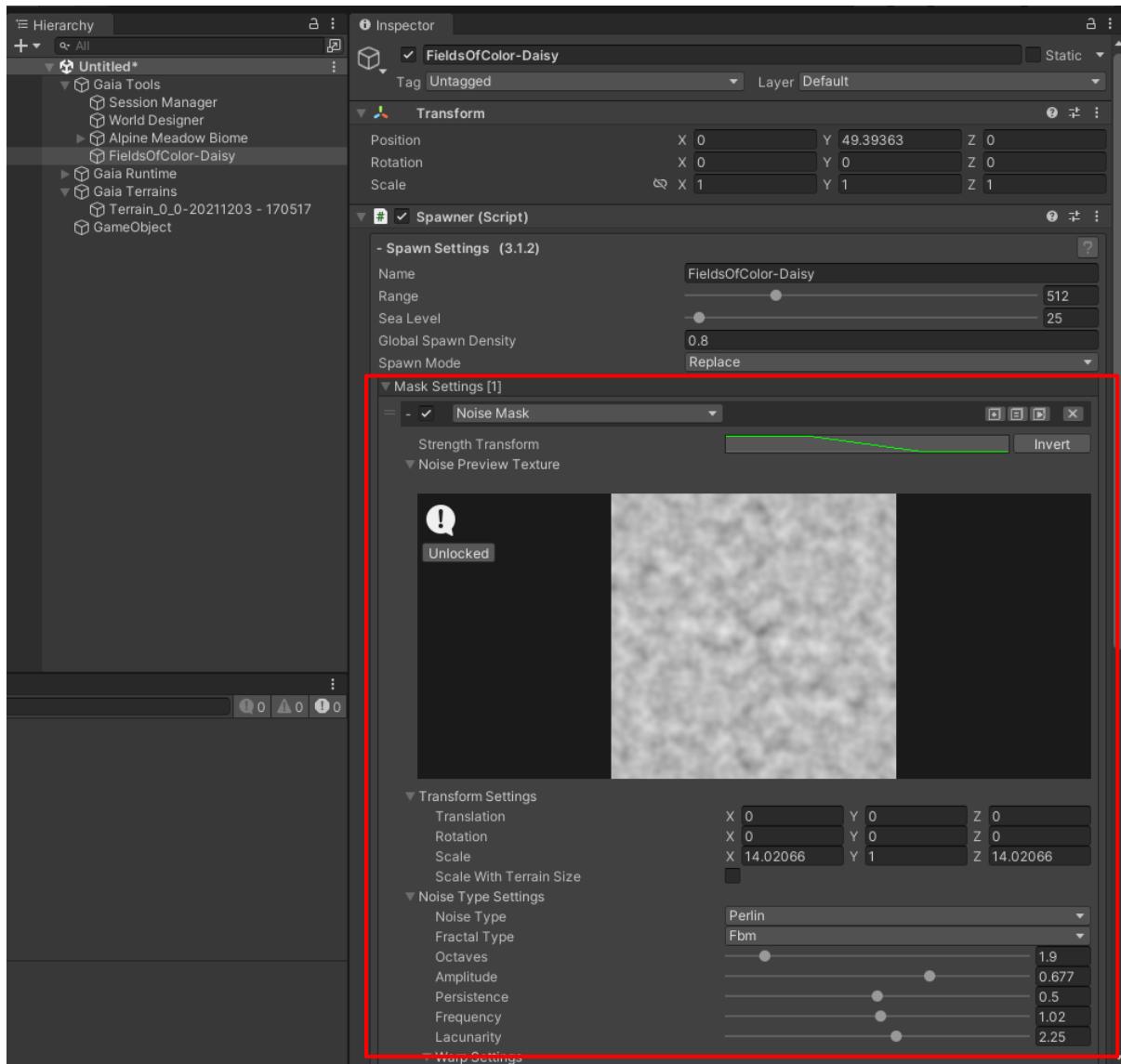
Press either the 'Spawn Local' or 'Spawn World' buttons to run the spawner:



This will spawn the terrain details to the scene.



By default, the vegetation items in these spawners will spawn mostly anywhere, but underwater. The pattern is controlled by a noise mask that you can find on top of the spawner.



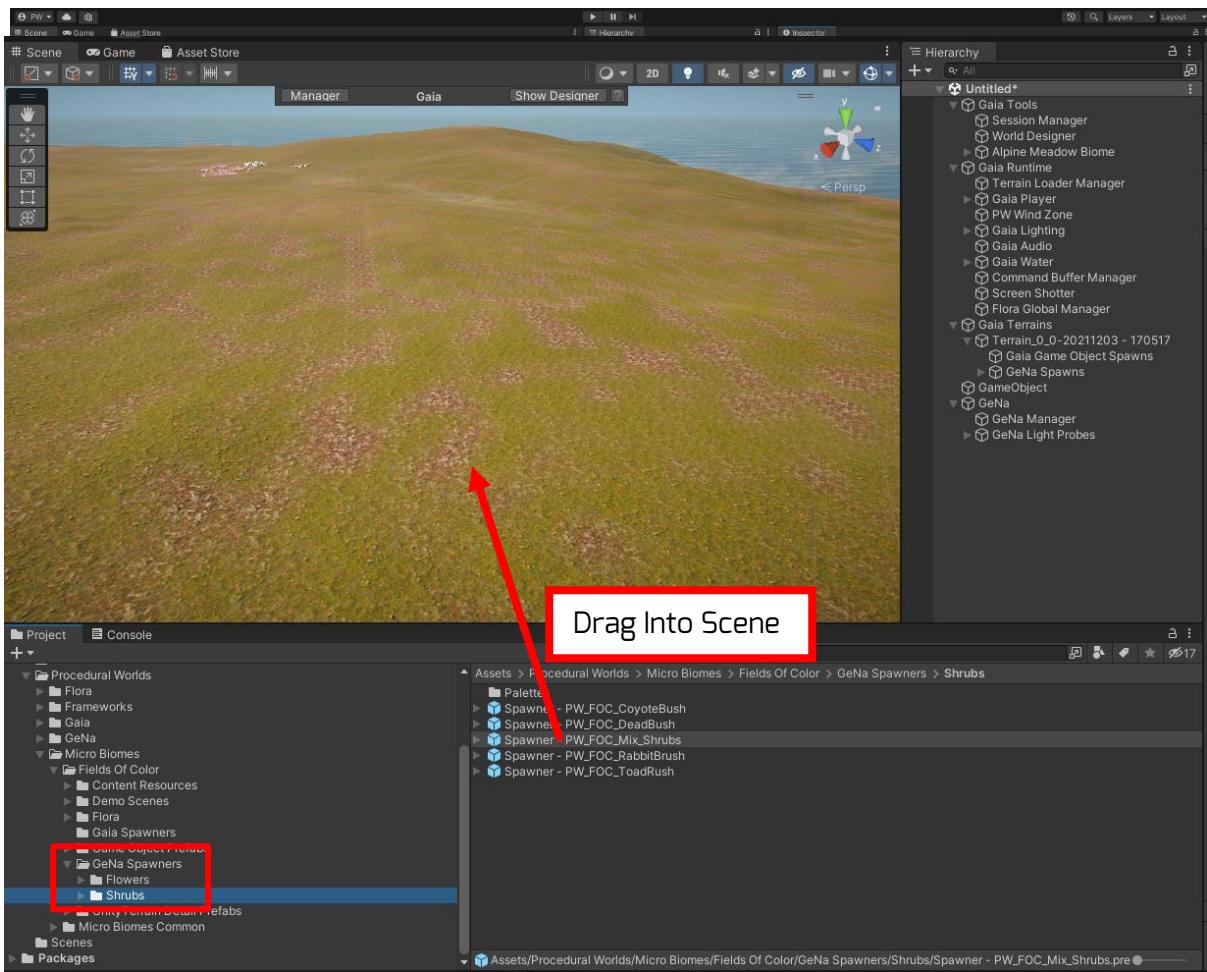
You will get the best results by adjusting the masks on this spawner to act the way you want them to – for example if you want the flowers to appear only around the coast, you might want to put a height mask on. If the flowers should only appear in a special clearing in the game, you might want to set up an image mask that masks out that clearing only. For more information on the Gaia mask please see the [article on masking in the knowledge base](#).

Please Note: The Gaia spawners create terrain details by default, as this is the most common use case for the assets in this pack. If you wish to spawn Trees or Game Objects instead, it is relatively easy to change the spawners. To do so, open the spawn rules and the resource settings, then switch the Resource Type from “Terrain Detail” to “Tree” or “Game Object”. Then put in the appropriate prefab from the “Game Object Prefabs” folder instead.

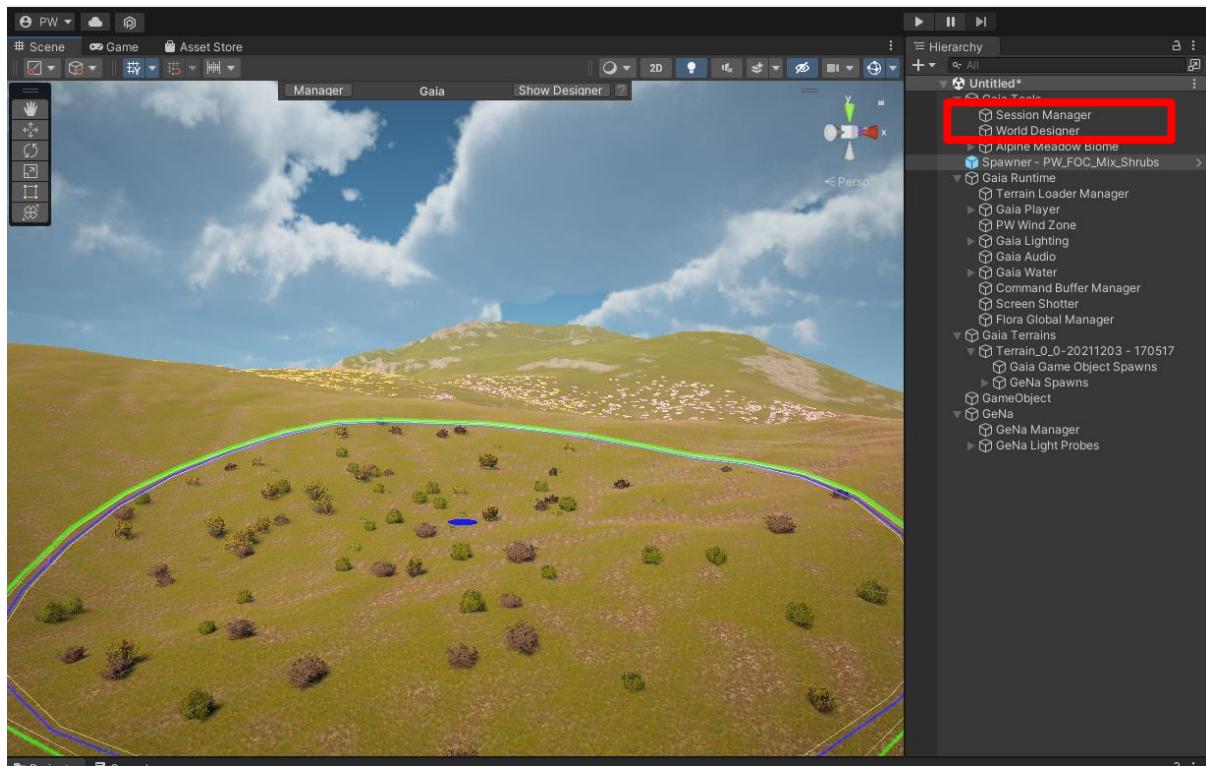
Here is how it would look like when switching a spawn rule to spawn trees instead:

Spawning the assets with GeNa (Pro)

To use the premade spawners for GeNa, navigate to their location in the project: Procedural Worlds -> Micro Biomes -> Fields Of Color -> GeNa Spawners. Pick a spawner prefab and drag and drop it into the scene.



The GeNa spawner is now being added to the scene hierarchy and ready to use. You can begin spawning with Ctrl + Click.

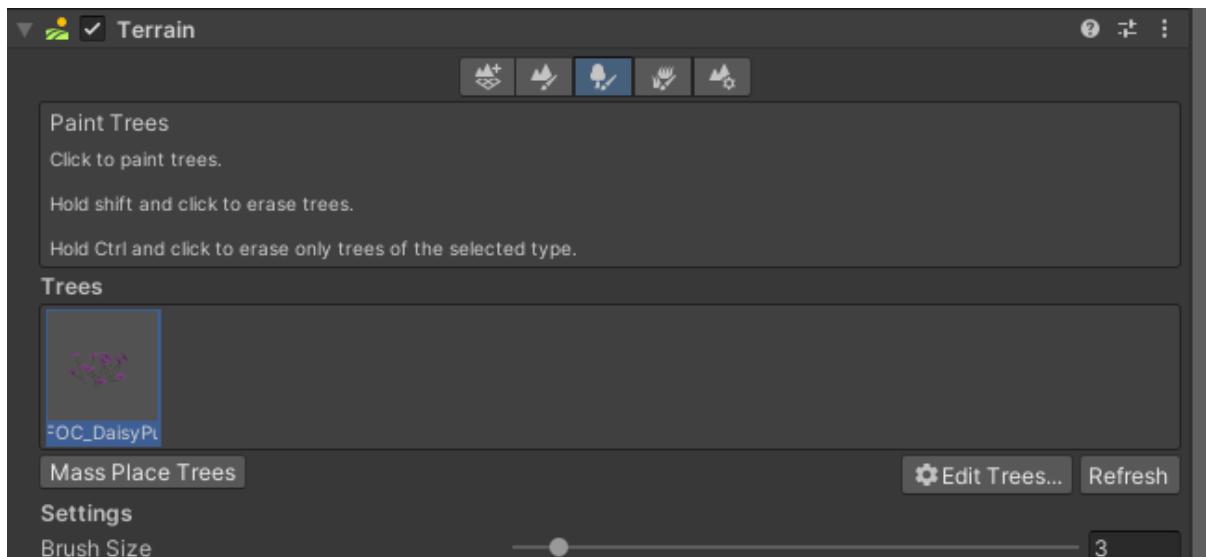


Please Note: The GeNa spawners create Game Objects by default, since this should be the most common use case for manually spawned vegetation & Game Objects can be spawned on meshes as well.

If you want to change the spawners to spawn trees or terrain details instead, you can do so by setting up the object you want to spawn in such way on the terrain as per on the instructions above (see “Background – Displaying Vegetation in Unity”).

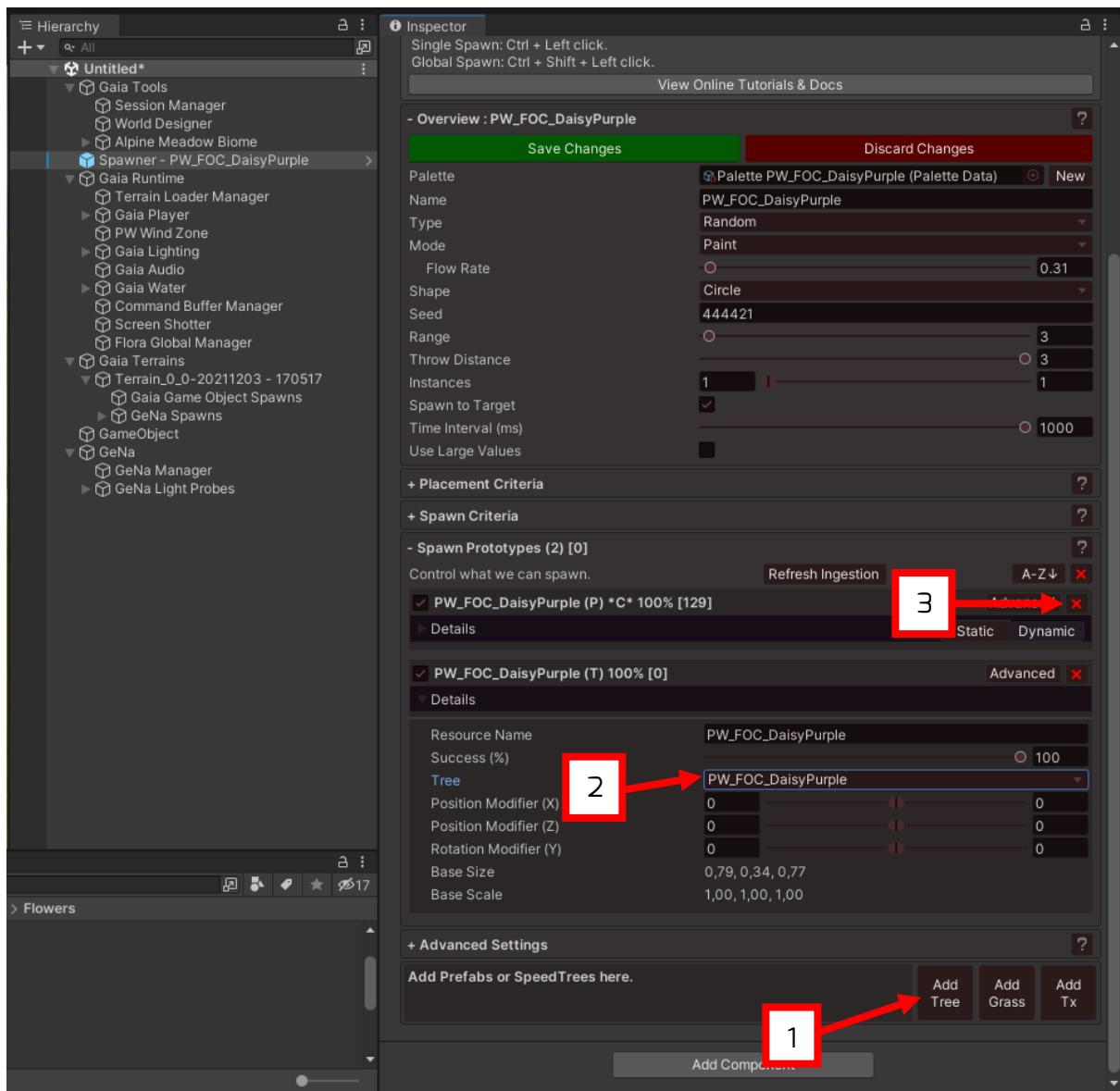
Then you can consume this object in the GeNa spawner with the “Add Tree” or “Add Detail” button. This allows you to select the object you just set up on the terrain for spawning, and at this point you can remove the original game object spawner.

For example, to set up the “DaisyPurple” GeNa spawners to spawn trees instead of game objects, you would set the object up as tree on the terrain:



And then you could open the spawner and click the “Add Tree” button (1), and in the tree prototype make sure that the correct “tree” is selected (2), then remove the original game object resource (3).

The result would be the exact same spawner that now contains a tree resource instead a game object resource – in this way you could start spawning trees instead with your GeNa Spawner.



GeNa Spawner Examples



Using Spawner - PW_FOC_ClusterDasiyOrangeYellow



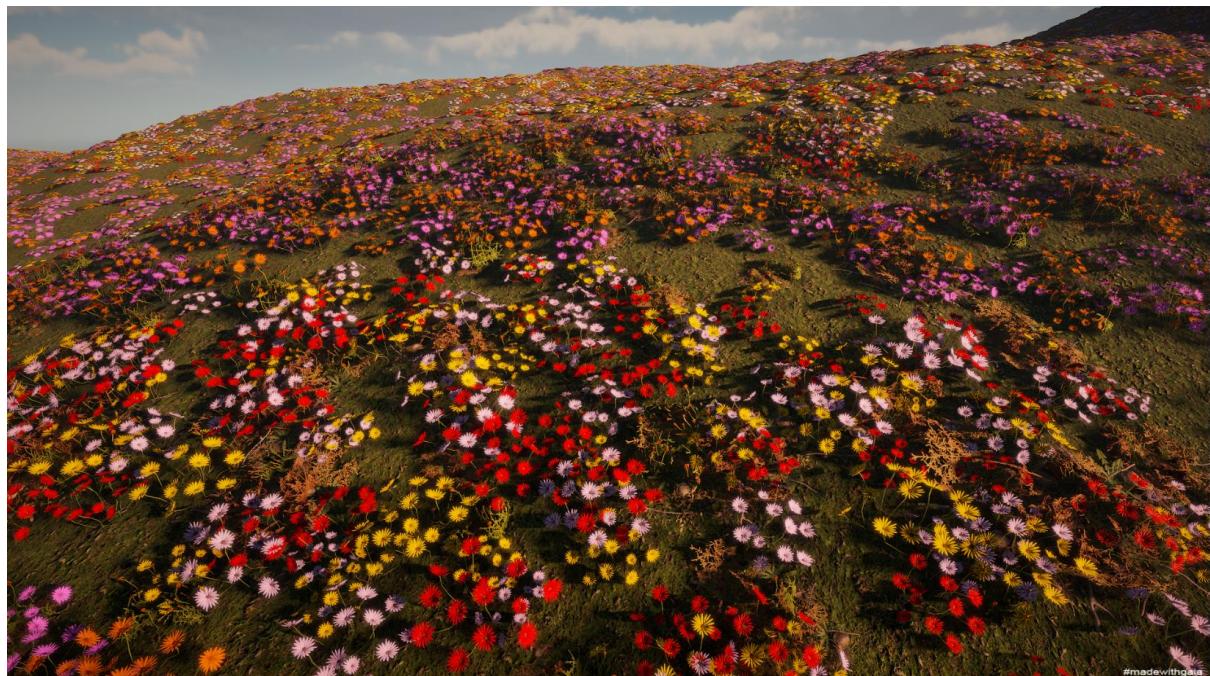
Using Spawner - PW_FOC_CoyoteBush



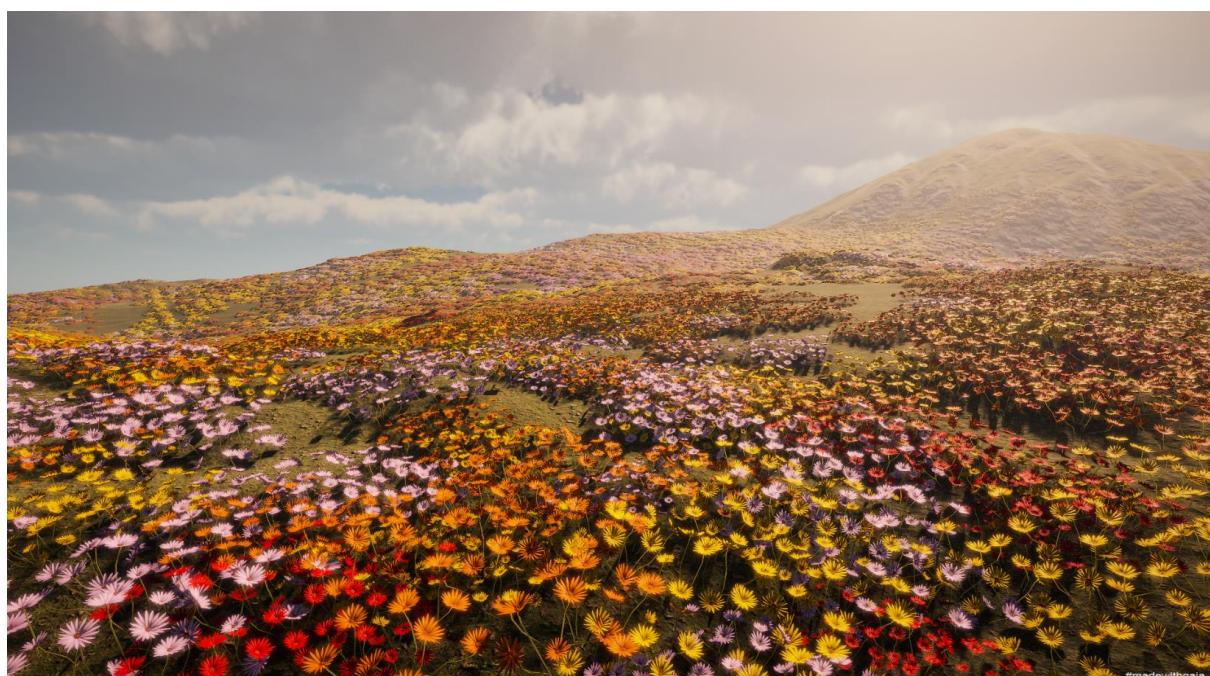
Using both *Spawner - PW_FOC_ClusterDasiyOrangeYellow* and *Spawner - PW_FOC_CoyoteBush*

Gaia Pro Biome Spawner Examples

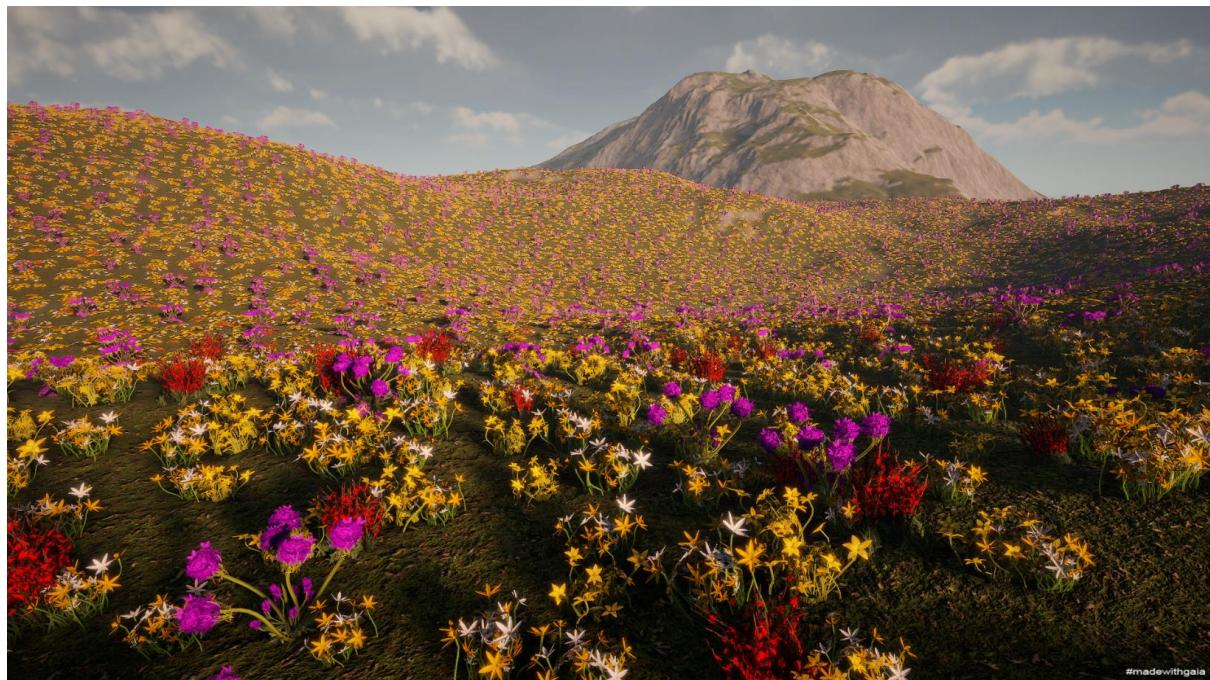
FieldsOfColor-Daisy



FieldsOfColor-DaisyCluster



FieldsOfColor-Flowers



FieldsOfColor-Shrubs

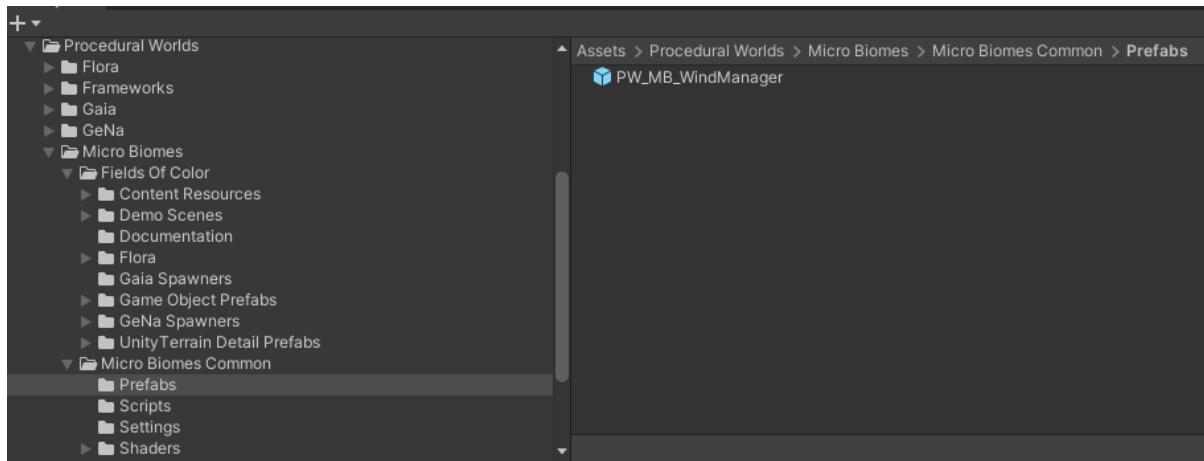


Additional Features

Wind

A basic wind manager is included in this pack that is used across all foliage materials. If you already have a Gaia Wind Manager, or a Flora Wind Manager, this prefab is not needed, as they perform the same operations.

To add wind into the scene, drag the prefab PW_MB_WindManager located in Procedural Worlds -> Micro Biomes -> Micro Biomes Common -> Prefabs into the scene.



The wind manager comes with Unity's wind zone parameters, as well some additional audio options.



If you want some wind audio to gradually increase depending on the intensity of the 'Main' parameter, you can assign an audio clip in the 'Wind Audio Clip' variable.

Terrain Layer

Included in this pack is a set of textures for a desert rocky pebble terrain layer, aimed to resemble some of the terrain as seen in Namaqualand in South Africa. This can be used as a single layer, or as an additional terrain layer in your workflow. The textures and terrain

layer can be found in Procedural Worlds -> MicroBiomes -> Fields Of Color -> Content Resources -> Textures -> Terrain Layer.



Lighting preset

A simple prefab of a lighting preset is also included in this pack, which was used in some of the promotional material and the HDRP demo scene. This lighting prefab can be found in Procedural Worlds -> MicroBiomes -> Fields Of Color -> Game Object Prefabs.

