

## **VEGETATION STUDIO PRO 1.2.2.0 SUBMITTED TO ASSET STORE 29TH OF FEBRUARY 2020**

### **IMPROVEMENTS**

- Option to ignore height when deleting vegetation from the persistent storage with a brush. For flying instances after changing the terrain.
- New Texture mask scale rule
- New Textyre mask density rule.

### **FIXES**

- Vegetation Mask include not working properly on MeshTerrain
- TextureMaskSettings not serialized properly
- Terrain texture inlcude/exclude sampling the wrong channels on new terrains in 2019.2+
- LOD3 distance calculated wrong for instanced indirect.

## **VEGETATION STUDIO PRO 1.2.1.0 SUBMITTED TO ASSET STORE 15TH OF AUGUST 2019**

On Unity 2018.4+ the latest version of the job,collection, burst and mathematics packages are required.

Post processing is optional from 2019.1+

### **FIXES**

- Fixed billboard shader compile error on Unity 2019.2+
- Fixed warning for Materialtype on Unity 2019.2+
- Fixed warning on SceneMeshRaycaster
- Fixed Job system warning due to API change in 2018.4
- Fix for multi camera billboard culling problem

## **VEGETATION STUDIO PRO 1.2.0.0 SUBMITTED TO ASSET STORE 18TH**

## **OF MAY 2019**

On Unity 2019.x the latest version of the job and collection packages are required.

### **IMPROVEMENTS**

- Added Quality Manager component.
- Added Predictive cell loader system.
- Setting to disable Instanced Indirect rendering on specific platforms.
- Added new HeightOffsetRange rule for controlling rocks lowered in the terrain
- Added TreeCreator wind controller
- Added custom speedtree 8 shader that supports instanced indirect. (Unity 2018.3+)

### **CHANGES**

- Updated name changes on some job functions.

### **FIXES**

- Extended ListExtension to work better with IL2CPP on some platforms
- Fix for inspector draw error on TextureMask tab of Vegetation System Pro component.
- Fix for Unity Terrain inspector showing a duplicate inspector warning in Unity 2019.1+
- Fix for compile error in 2019.3 alpha - ScreenshotUtility.cs

## **VEGETATION STUDIO PRO 1.1.2.0 SUBMITTED TO ASSET STORE 15TH**

## **OF APRIL 2019**

### **IMPROVEMENTS**

- Added function/button on the VegetationPackage to regenerate VegetationItemIDs
- Added helper component for MapMagic infinite terrain

### **CHANGES**

- Terrain is now exposed in the UnityTerrain component

## **FIXES**

- Cell cache and GC cleanup after generation vegetation color masks.
- Fix for terrain texture include rule that could exclude instances in areas where cells overlap multiple terrains.
- Changes to reflection loading of types. It now handles libraries with types that can not be loaded

## **VEGETATION STUDIO PRO 1.1.0.0 SUBMITTED TO ASSET STORE 3RD OF FEBRUARY 2019**

## **IMPROVEMENTS**

- Added Collider baking to the scene for use with Navmesh Baking
- Added SceneVegetationBaker component.
- Added VegetationColorMaskCreator component.
- Added ShadowMaskCreator component
- Added ObstacleMaskCreator component
- Added repeat functionality on texture masks
- Added LightLoader component that helps you add run-time loaded directional lights for shadow culling
- Added custom shader controller class for the SyntyStudio Nature pack trees.
- Added custom billboard atlas render shader for SyntyStudio Polygon Nature trees.
- Colliders now get the layer set for the VegetationItem
- Added shader controller for CTI trees supporting billboard snow, rain, wind and other settings
- Added Snow Color and Snow Specular color to the Environment settings. These will be passed to shader controller classes
- Colliders can now have custom tags set.
- Mesh Colliders can now be set to convex
- Colliders now have a NavmeshArea setting that is applied when baking the colliders
- Added global shader variables for microplat shadow and grass mask.

## **CHANGES**

- Added early rejection of cells with 0 instances of a vegetation item in the render loop.
- Increased resolution and added job interpolation on splatmap curves to reduce some banding issues.
- Added GenerateSplatMap function that takes a single terrain
- Splatmap noise rules are now in worldspace and will work across terrain borders independent of

terrain size and splatmap resolution

- Splatmap generation is now done in sequence for multi terrain setups. Lowering memory requirements for multi terrain setups

## **FIXES**

- Fixed an issue with double info components on colliders from prefab
- Remove Using not needed in PolygonBiomeMask.cs
- Added better interpolation on the splat map generation rule curves
- Fix for windzone speed not affection FAE wind controller.
- Fix for error that could happen if a texture mask(Texture2D) was edited while in use.
- Fix for lightprobes giving darker areas with instanced indirect rendered vegetation
- Removed unused using in IVegetationStudioCamera code
- Fix for ClearBillboardCellsCache giving an error if called before billboard system is set up properly.
- Updated naming in menu when creating VegetationPackages
- Fixed culling issue where tree height was not considered in cell visibility culling.
- Heatmap on terrain is now disabled after generation from key shortcut and BiomeAreaMask Inspector
- VegetationMasks can now add nodes on MeshTerrain
- Fix for billboard shadows not working in 2018.3
- Fix for colliders not working on run-time added cameras
- Fix for run-time prefabs not working on run-time added cameras
- Fix for run-time prefabs not working on run-time added cameras

## **VEGETATION STUDIO PRO 1.0.1.0 SUBMITTED TO ASSET STORE 13TH OF NOVEMBER.**

- Visible cell debug info now shows distance band as colors
- Added padding to billboard atlas normals
- Added options to flip backdfacing normals when generating Billboard atlas.
- Added RemoveCamera static function on VegetationStudioManager
- Added CameraLoader component that helps adding/removing run-time loaded cameras
- Splatmap generation can now be enabled/disabled per biome
- Added option to change the number of terrain textures for vegetation packages
- Added option to set tag on colliders
- Billboards now have a separate layer setting on the render tab
- Copy/paste curves on the curve editor now also copies tangent settings
- Added remove all terrain button in the inspector

- Added BackgroundMaskCreator utility component
- Added OnCreateCollider and OnBeforeDestroyCollider to the ColliderSystem

## CHANGES

- Changes to distance used for shadow visibility culling
- Renamed RefreshTerrainHeightMap to match the API in Vegetation Studio std
- Updated the Fantasy Adventure Environment shader controller to support some new shader features.
- Added biome name and biome type to dropdown lists
- Added early rejection for biome mask samples based on mask rect. For mask covering partial cells.

## FIX

- Run-time prefabs using a pool can now be destroyed without making an error. They will be removed from the pool also.
- Run-time spawned prefabs now handle floating origin correct
- Colliders now handle floating origin correct
- Fix for water shader in demo running on Metal
- Global density of 0 did not remove all trees.
- Fix for splatmap generation error in a job
- Setting global density to 0 did not remove all vegetation.
- Fixed compilation error on TouchReactNode with Amplify Editor installed

## VEGETATION STUDIO PRO 1.0.0.0 ASSET STORE RELEASE VERSION

### Improvements

- VegetationItemInstanceInfo and RuntimeObjectInfo components is now added to objects spawned by the run-time prefab spawner.
- Shadow visibility testing for instanced indirect vegetation is now working on the GPU
- Added the missing selector UI for selecting what texture mask group to use for Texture Mask Rules
- Added system for disabling edge distance calculations for selected edges in BiomeAreaMasks.
- Added API on BiomeMaskArea that can set disabled edges
- Noise cutoff and density jobs now uses IJobParallelFor
- Some spawning rule optimizations. Early instance rejection for noise rules. Goes wide on all cores.
- Internal core change in spawning rules. IJobParallelFor is now used where possible to share load

better with few vegetation items and many available cores.

- Jobs are now submitted multiple times in the spawning process to start processing while scheduling jobs.
- Last of the spawning jobs moved to the new mathematics library
- Persistent storage now has a bake all items from all vegetation packages option
- Persistent storage now can clear only baked items
- Matrix4x4 creation from the persistent storage now goes wide on all cores
- Setting for background color when generating billboard atlases.
- Reduced temporary memory usage while baking to the persistent storage
- Memory is now compacted when clearing the cache of a VegetationCell
- Big spawning memory refactoring. Faster spawn jobs and less memory bandwidth needed.
- Added pooling system for temporary spawning memory

## Changes

- Copy/Paste will now select the pasted vegetation item
- TerrainLayers created in Unity 2018.3+ is now stored in a subfolder of the VegetationPackage directory
- Runtime spawned prefabs will now keep the original prefab name
- Added default splatmap rules for the first 4 textures in a new vegetation package.
- Minimum cell size set to 25 meter
- Default cell size set to 100 meter
- Some wind changes to NatureManufacture shader controllers
- Added Update button to change vegetationcell or billboard cell size.
- Increased Blend Distance for Postprocessing volumes

## Fixes

- Fix for heatmap not working on 2018.3 with instanced terrain
- Fixes for masks not disposed correctly if VegetationStudioManager was not in the scene
- Fix for error when adding camera run-time
- Fix for splatmap not generating correct with noise turned off
- Fix for splatmap generation returning wrong value with broken curve object.
- Fix for vegetation package not set dirty if a corrupt curve was fixed.
- Fix for vegetation cell temporary memory not released as early as possible when cell was spawning billboard trees.
- Removed some warnings
- Fix for VegetationCell error that could happen when calling clear cache after Disposing the internal memory structure

## VEGETATION STUDIO PRO BETA 0.9.2.3 - 16TH OF OCTOBER 2018

Another beta ready for download. Demo scenes added, harvesting demo working. Some new splatmap generation rules and a system for locking painted textures from change when re-generating.

### Improvements

- Added new concave/convex splatmap generation rules.
- Added River and Seaside as biome types in the predefined list.
- Added LODGroupVegetationMeshCombiner Component.
- Added setting for disabling rendering of Unity trees and details on the UnityTerrain Component
- Added label on RuntimePrefabSpawner component to show what VegetationItem is selected.
- Added 3rd party licene overview in asset package
- New splatmap generation system where you can lock textures to not be changes when generating the splatmap. For manually painted paths etc.
- Added VegetationItemInstanceInfo to collider objects
- Added RuntimeObjectInfo to collider objects
- Added Demo scene
- Added Extended demo scene for download. Link in readme file.
- Added PDF Setup Guide
- Added 3 Shader controllers for the Fantasy Adventure Environment asset. Foliage, Grass, Trees
- Added detection for color space change Linear/Gamma and regeneration of tree billboard atlases

### Changes

- Biomes can be replaced on the biome tab with drag/drop on the old biome
- The TerrainSystem component will now keep references to the TerrainLayer component and update this when updating terrain textures on the Unity Terrain.
- Changed default vegetation cell size to 100 meter
- Changed default billboard cell size to 500 meter
- VegetationItemMask now only refreshes the affected tree/rock type when created with VegetationItemInstanceInfo class or having VegetationItemID set
- Terrain System noise and curve rules are now colapsable in the inspector
- Adjustments to billboard wind
- Moved VegetationMask updates to earlier in the frame to happen before spawning.

### Fixes

- Fix for RuntimePrefabPool using wrong Quaternion.Euler class
- Fix for UI error on RuntimePrefabSpawner if there is no vegetation package on the vegetation

system

- Fix for Materials using “\_CullFarStart” not showing grass in the distance.
- Removed error in editor mode that could happen with maximized gameview
- Removed collider pool compile warnings on 2018.3 beta
- Fix for Tree Creator shader not rendering leaves in builds
- Fix for 4 spawning jobs not using the burst compiler.
- Fix for offset bug when using terrain texture include and exclude rules

## **VEGETATION STUDIO PRO BETA 0.9.0.1 - 11TH OF OCTOBER 2018**

The run-time prefab spawner is now working. Next up is a list of smaller changes, demo scene and documentation.

If you are upgrading a project from an earlier beta and want to use the Run-time Prefab Spawner just add the component to the same GameObject as the VegetationSystemPro component.

### **Improvements**

- Added Runtime prefab spawner component with all the functionality of the original in Vegetation Studio.

In addition to this

- Pooling system
- Individual distances per item
- Rules saved in biome/vegetation packages
- All culling and selection done in jobs/burst
- Enabled Collider system in editor mode
- Added Normal render mode using DrawMesh.
- Added VegetationMeshCombiner component that can help merging trees with multiple meshes

### **Changes**

- ColliderSystem only sees distance band 0 vegetation cells as intended

### **Fixes**

- Fix for object colliders not spawning correct.
- Visibility toggle for colliders not adjusting colliders in pooling system
- Cleanup in VisibleVegetationCellSelector class
- Fix for Allocator.Temp Error on 2018.3 in RaycastTerrain when TempJob should have been used.
- Fix for Allocator.Temp Error on 2018.3 in MeshTerrain when TempJob should have been used.



## VEGETATION STUDIO PRO BETA 0.8.0.0 - 7TH OF OCTOBER 2018

The collider system is now added and working. Next in line is the run-time prefab spawner and a list of smaller changes.

For upgrading old setups to the collider system just add the ColliderSystemPro component to the same GameObject as the VegetationSystemPro.

### Improvements

- Added collider system with the following features
  - Individual distance per object
  - Multi camera support with overlapping viewpoints
  - Primitive collider setup
  - Use colliders from source prefab
  - Pooling system
  - Culling and visibility testing done in jobs/burst
  - NavmeshObstacle component as option
- Added OnAddCamera and OnRemoveCamera delegates to VegetationSystemPro
- Added a selectable label on the VegetationPackage inspector to get easy access to the VegetationItemID of any item
- Added NormalStrength setting to billboards
- New billboard generation setting that allows you to regenerate the normals used for generation and/or blend between original and new normals
- Added delegates for all OnClearCache function on VegetationSystemPro class
- Added forwardadd additional light passes for the included speedtree shader. This should give multi light support in forward mode. ‘
- Added forwardadd additional light passes for the included speedtree shader
- Updated github repo with info on how to add the forwardadd pass to other shaders.  
<https://github.com/AwesomeTechnologies/Vegetation-Studio-Instanced-Indirect/blob/master/README.md>

### Fixes

- Fix for baked vegetation in the persistent storage not rendering instanced indirect
- Fix for nativeArray not disposed on the PolygonMaskArea
- Fix for error if a prefab is missing a mesh. It will be replaced with an empty mesh now
- Fix for error in render loop if the prefab has more submeshes than materials

## VEGETATION STUDIO PRO BETA 0.7.0.1 - 23RD OF SEPTEMBER 2018

The Persistent vegetation storage is now working. It can store vegetation from all terrains added to the Vegetation System and multiple biomes. The importers are not enabled yet. That will be later in the beta.

### Improvements

- Added PersistentVegetationStoragePackage scriptable object
- Added PersistentVegetation Storage
- Render billboards only mode on cameras. Good for water reflection cameras etc.
- Added Refresh Vegetation button om inspector. This will refresh all heightmaps and clear cache. For manual refresh after 3rd party tools changes

### Changes

- Updates to UnityTerrain component to access the splatmaps befor CTS removes them to remove render passes. This requires a CTS update that is comming.
- API changes to VegetationCellSpawner class. Multiple variants of SpawnVegetationCell exposed.
- Added warning if multiple cameras are added and render direct to camera is not selected
- Billboards now render with individual MaterialPropertyBlocks per camera.
- Update some UI help texts
- Internal changes to reduce memory use for vegetation.

### Fixes

- TextureMaskType on TextureMaskGroup did not serialize
- Fixed missing namespace on ScriptableObjectUtiliy making a conflict with some devdogs tools
- Fixed problem with wind samplers not set up correctly when adding cameras run-time
- Fixed problem with camera compute buffers not set up when adding cameras run-time
- Fixed 2 inline out variable declarations that needed c# 7.0+
- Added fix for some tree billboards generated with an artifact at the top. Needs billboard regeneration
- Fixed EnableRuntimeSpawn not working correct for billboards
- Fix for not all terrain added automatic when pressing the add all UnityTerrains button
- Forcing sceneview repaint after "Refresh Vegetation" button
- Fixed compile warning on MeshTerrain

## VEGETATION STUDIO PRO BETA 0.6.3.4 - 12TH OF SEPTEMBER 2018

### Update guide

There has been some folder changes and some removed files. It is important that you remove the old folder before importing the new version.

### Improvements

- Package Manager requirements are now. Mathematics, Jobs, Burst, Collections and Post-Processing. Entities is not longer needed
- Restructured code to support assembly definition files.
- Created editor and run-time assembly definition files for Vegetation Studio Pro
- Created editor and run-time assembly definition files for Touch React Pro
- Added Smoothness, occlusion and Metallic setting for billboards
- Added Specular alternative to the billboard shader
- New rotation setting for Billboards. When using "2D" billboard they only orient around the Y axis.
- No need for "unsafe code" setting in unity project.
- API changes to support Unity 2018.3 without warnings.
- In Unity 2018.3+ TerrainLayers are now created and saved to project when applying textures from vegetaton packages to terrains.
- Added Speedtree 8 ShaderController
- Added 360 degree culling mode to cameras. This can be used with 360 video export.
- Vegetation now updates when terrain height is changed with the Terrain inspector tools
- API for Refreshing heightmap exposed on VegetationStudioManager

### Changes

- Removed the last use of the MathLib.dll All code in c# and burst jobs now.
- General code cleanup
- Generating splatmap now clears vegetation cache to respawn based on new splatmap
- Increased max blend distance on BiomeMaskArea to 300
- Remove a multicompile keyword not needed in the VS\_Speedtree shader reducing variants needed
- Removed SetCamera static function on VegetationStudioManager. Will be replaced by AddCamera/RemoveCamera functions
- Added AddCamera and RemoveCamera static functions on VegetationStudioManager
- Added SetSunDirectionalLight static function on VegetationStudioManager
- Some Cleanup and optimization on BillboardShader
- Updated PrefabUtility.CreatePrefab to PrefabUtility.SaveAsPrefabAsset on Unity 2018.3
- Added internal functions for adding multiple terrains at the same time. Optimizing stats

generation.

- Changes to progressbar when generating biome splatmaps
- Changed minimum billboard brightness from 0.5 to 0

### **Fixes**

- Fixed billboard related run-time error with multiple cameras
- Removed potential null exception error in AddVegetationMaskToVegetationSystem function.
- Fixed for BiomeMaskAreas not updating if only scale of the Transform was changed
- Fix for terrain heights not refreshing on GenerateSplatmap
- Removed error that could happen when Generating hull outline on a VegetationMaskArea with no meshRender children
- Fix for NativeArray error when using undo while painting the terrain.
- Fix for wind sampler error when adding a camera run-time
- Fix for deleted prefabs creating error. Now replaces with red cube to spot missing item.

## **VEGETATION STUDIO PRO BETA 0.6.1.1 - 16TH OF AUGUST 2018**

### **Fixes**

- Temporary using UnityEngine.Quaternion and not Mathematics.Quaternion in a job until Unity gets the package manager synced. They pulled the namechange they posted yesterday.

## **VEGETATION STUDIO PRO BETA 0.6.1.0 - 16TH OF AUGUST 2018**

### **Improvements**

- Added a Vegetation Type selector to the vegetation item list.

### **Changes**

- Adjusted max cache size for preview images.
- remove warning about removing frustum culling on the camera. in inspector

### **Fixes**

- Add nodes on BiomeMaskArea did not work on mesh colliders.
- Fixed error with concave mesh colliders on post processing volumes.
- Fixed offset error while using floating origin and terrain texture rules
- Fix for testing updated cell bounds against all added terrains when not needed.
- Fix for terrain texture curve rules updating laggy
- Fix for compile errors when updating entity package to newer version

## VEGETATION STUDIO PRO BETA 0.6.0.4 - 21TH OF JULY 2018

### Improvements

- Added curve rules for Height
- Added curve rules for Steepness
- UnityTerrain now have a TerrainSourceID setting
- RaycastTerrain now have a TerrainSourceID setting
- Added Terrain Source spawning rules
- Added Randomize Position setting
- UnityTerrain component now supports multi component editing
- Texture masks

### Changed

- Sea level will now only change when you press enter or the field loses focus.
- Moved visualization of VegetationSystemBounds on OnDrawGizmosSelected
- Changes to RaycastTerrain and UnityTerrain for use with floating origin. It now stores its own worldspace position to be more flexible when loading terrains.

### Fixes

- Errors that could happen if MeshTerrainData was not assigned to the MeshTerrain at startup.
- Added warning when trying to generate mesh terrain BHV tree with no MeshTerrainData object.
- Removed compilation errors if post processing stack 2.0 was not installed
- Fix for splatmapArray not created error that could happen when unloading terrains while moving camera.
- Fix for billboards not refreshing when adjusting height and steepness curve rules.