

with Strata Studio Pro Frank Vitale

The following tutorial is based on “Digital Botany” or creating plants, digitally. Plants are great fun to work with as you don’t have to be extremely precise. As a matter of fact, it is better that you are not or you’ll end up with very unnatural looking vegetation. Inconsistencies, variation in shape and color, variations in health and level of growth all lend themselves toward creating something that looks natural. If you plan on or have a need to create plants, determine the importance of the element in your scene and if it is a dominant element be sure to research that plant. Go out and find one, find 10. Photograph them and keep those photos handy for reference. Not only are such photos practical for modeling reference, but they can be invaluable in developing textures that



are straight from the source, which is without a doubt the best way to achieve realism. On the other hand, models of plants can quickly get out of hand and slow production to a near halt so it is important to be careful how much detail you put into any one element as it is easy to “bog” down your scene. Having said that, the best way to avoid creating nightmare projects is through the use of “instancing,” not just entire plants but the elements that make them up such as a blade of grass, a twig or a leaf. Use texture maps wisely, large enough but not too large.

This tutorial or rather tutorials are set up differently than most. We are going to break down the individual elements of this scene and explore them as “mini” tutorials. That way you can pick and choose the areas that interest you and apply what you discover to your own projects instead of duplicating what somebody else has already done. This way when you are through you will have a work that is truly your own. Conversely, if we were to attempt to go through this particular scene from start to finish it would consume this entire issue and probably a week of your time.

Strata Studio Pro version 2.5

Two applications were used to create this environment, StudioPro 2.5 and Photoshop 4.0. Photoshop was used exclusively for the development of all the textures and

everything else was done directly in StudioPro. Now StudioPro allows the import of several model formats including outlines from Illustrator, but as a Beta tester, I wanted to put StudioPro’s pen tool to the test so I created all the outlines inside of StudioPro — it performed quite well.

StudioPro works with a grid based environment — the active grid is where the modeling takes place. The grid can be turned off in which case the modeling is free to take place in full 3d space. Working without the grids however can get messy quick so I recommend using them for all they’re worth. It’s very easy to switch between active grids by simply hitting the x, y or z key on your keyboard. They can also be accessed through the edit menu. I don’t want to bore you too much by going over all the StudioPro features, but I do want to touch on some of the ones we will be using.

First off, I mentioned that with a scene such as this one, with lots of plants, that you want to use “instancing.” Well, StudioPro is based on the idea of instancing, they call it “shapes” and it is the basis of all modeling in the program. I’ll go into the details in the body of the tutorials, but in a nutshell it works like this: You launch the program, create a new file and you are presented with a window in which you can begin to model. This is your main project window. You can start your modeling process here if you like and everything is fine, alternatively

you can create a new “shape” window and begin modeling within it. When you are through or, before you’re through you can close the shape window and your “shape” is saved, easily accessed through the shape tab on the resource pallet. From the resource pallet you can insert this saved shape into your environment as many times as you like; it is an instance.

Working this way will go a long way toward keeping your project manageable. Any manipulation you do to your shape in its shape window is instantly reflected to all the copies of it within your main project window. If you apply textures to your shape in its shape window all the copies will have that texture. If you don’t want them to all have the same texture you can wait and apply the textures from within the main project window and give each instance its own unique texture. It is a very flexible way of working. You might ask, “Why not just copy the object in the main window?” Well, if the object you create is 200k in size then each copy will also be 200k and before you know it you’ll be slogging through a project that is much larger than need be. Using shapes instead will keep your project substantially smaller as an instance is only a few k, no matter how large the object.

Some of the other tools or features we will use here include the “Skin tool” which allows you to create a Bezier mesh by connecting either closed or open Bezier lines.

This is a great way of creating objects within Studio Pro as it is completely flexible. You can unskin any time any portion of your object and not lose the texture mapping information, unless, of course, you completely unskin the object. You can also reshape the individual ribs or Bezier lines that make up the skin object. Another commonly used tool is the path extrude tool which extrudes an open or closed line along a path. The path extrude object can then be converted into any number of object types from Bezier mesh to polygon group including skin object. Converting to a skin object allows you to create path extrude objects that change shape along their length. The “lathe” tool is also quite powerful as it not only allows you to create 3d lathed objects from an open or closed Bezier line, it also allows you to sweep or spiral that shape creating objects like springs or screws. Another useful feature is “stencil mapping.” Similar to transparency mapping, stencil mapping allows you to use maps to cut out shapes, great for grass or leaves. Extreme caution is advised when using stencil mapping or transparency mapping as nothing slows down a render like transparency, except maybe volumetric lighting which we will also use, go figure.

The Entrance, What’s up with that?

Before we start the actual tutorials I’d like to tell you a bit about the scene pictured here titled “The Entrance.” First

off, the idea is “Digital Botany” but instead of creating a potted plant or a dandelion, I decided to create something that was just a bit darker. Inspired by the goblin works of Bill Fleming, I decided to play on that theme and create “The Entrance.” The entrance to where you ask, that is part of the allure, only time will tell. This is meant to be a dark environment deep in a wooded area, possibly a jungle that hides a gated entrance to some mysterious place. I used volumetric light with a gel to simulate a bleak amount of sunlight breaking through the canopy. I then used several other lights to illuminate the scene. The two point lights are fairly obvious as the light from the lanterns on the posts. They are very warm and did not light the scene sufficiently so I also added 2 more spotlights to simulate the bounce and fill to give the scene a natural feel. Most of the plants including the tree and the hillsides were created using skin objects. The vines, grass and reeds were done with path extrude objects. The steps were also done as skin objects to simulate the wearing down of the center of the step. One more useful tool within the program is “Import as 3d mesh.” This is just like “Cybermesh” the John Knoll plug-in for Photoshop. It allows you to import gray scale files as meshes and give you a great deal of control, see the section on “Water and Algae.” The grass that caps off the hillsides was done with the use of a skin object and mapping with a stencil map. This was a quick and practical way to achieve the required look. The water was done

simply as a flat plane with the “Extend Ripples” extension applied. Ripples offers a great deal of control over how many generators are used and how the surface’s diffuse attribute is broken maintaining a natural look.

Tutorial 1 - The Tree

The first object I’ll cover is the hero of our scene, the tree. The idea here was to create an old tree that could be dead or at least dormant, first off to add contrast to the scene and second to keep the data base down by not creating leaves. One way to create objects such as these is using the “skin tool.” First you create an outline with the pen tool then duplicate that outline as many times as required adjusting the shapes and then use the skin tool to test your results. Moving back and forth between skinning and unskinning and using the “reshape” command you’ll be able to create a similar object in a fairly minimal amount of time. An important consideration before you begin to model a tree or branch is how you plan on texture mapping it. If it is fairly symmetrical you could use a cylindrical projection but that can look a little unnatural as the texture will not follow the natural flow of the shape and you might end up with some streaking where the normals of the polys are aligned parallel to the direction of projection. The best way to map such objects is with UV. Using UV mapping your texture map will follow every twist and bend you create and look very natural.

So Launch StudioPro and let's get going. First either click on the little page icon at the upper left of your screen or go File/New. You'll be presented with a new window which is your main project window. Since we are only creating a single tree here we will not yet use instancing. You should see a blue grid in the window which is aligned with the x and z axis. This is the y grid, anything we draw or create will be created on this active grid. Try switching between the various grids by hitting the x, y or z keys. While you're at it have a look at Edit/Set Units... this is where you adjust the settings for your grid. Feel free to change the setting in "Grid lines every..." from 1 to .5, this will give you a tighter grid to work with.

Now we will create the first of our ribs or sections to later be skinned. Think about what the cross section of the tree you wish to create will look like; that is what we'll create. We will use the pen tool, the 8th icon down the tool bar on the right to create that cross section. First you should practice with the pen tool to familiarize yourself with its options. Click once with the pen tool on the grid. Don't hold the mouse button down; just click once. Move the cursor and you'll notice that a blue line connects it to the vertices you inserted. Now click and hold the mouse button down and drag. You are now adjusting the Bezier curve with one of its handles. Release the mouse and the first curve is created and a straight blue line connects your second vertex to the cursor. The next time

you click the mouse a curve will be created that is a mirror of the first curve. If you click once the curve is set, you can click and hold to adjust the curve by dragging the mouse. Don't worry about getting the curve perfect as you lay it down for the first time, reshaping the curve is the way to get it just right. If a closed shape is what you are after, a single click on the first vertex will close the shape. If you wish to keep the curve open, simply move the cursor to the tool bar and single click on the move tool or any other tool to exit the pen.

Now that you've created a shape you can move it around or further manipulate it. Use the move tool, first row second item, and click on the shape you created. Its handles appear allowing you to move it constrained to a direction using the red handles or you can simply click on it and move it around freely. Next we will reshape the object. With the object selected click on the "reshape" icon at the top of the screen, it is the one with the little curve handles, 8th from the left. The command can also be accessed through Modeling/Reshape. You'll now notice that the tool bar has collapsed to show just the tools for reshaping and all the vertices are visible with curve handles. Using the pointer tool, 4th one down on the left, you can adjust the vertices. Click and drag on a vertex to move it. Shift click on several vertices to move more than one, or click and drag on a handle to adjust the curve. All of this is taking place on the active y grid. If you need to

add a point or break a handle use the option key. Be careful though if you try and break a handle that lies on the curve you'll end up adding a vertex instead. If you have a corner vertex, one without handles, and you wish to add handles to create curves, hold down the command key and click and drag on the vertex. A single handle will emerge from the vertex creating a curve. If you need to have curves from both sides of a vertex repeat this, dragging the other way. This naturally creates a broken set of handles. If you do not want broken handles use the "align handles" tool at the top of the screen, it's the 3rd from the right, the one with the aligned handles. Select just the vertex you wish to align and click on the align handles button. When you are finished adjusting the Bezier curve you'll want to hit the "end reshape" button, it's right next to the reshape button, the one that looks like a hemisphere.

Now that you've got the pen tool down we can make a tree, or at least the trunk of a tree. Start by creating the first cross section or rib as we discussed above. It often helps to switch views, in the upper left corner of the window you can switch from an isometric view to a top view to more easily see what you are

doing. Since we are going to use UV mapping, do your best to keep the vertices evenly spaced and not too numerous, our final object is spline based so it will render smooth. In this case use around 10 vertices to make up your rib. (I'll use the term rib from this point on to describe the cross sections). After you've completed the first rib you'll need to duplicate it for the second. Be sure you clicked the "end reshape" button. Select the rib with the object move tool from the main tool bar and holding down the option key, click on the center red dot of the rib and drag a copy vertical. Using the center handle we are able to move an object perpendicular from the active grid. Now reshape that rib. Generally I'll rotate the rib a

few degrees, use the rotate tool on the main tool bar just like the move tools the handles constrain the motion. Use a corner handle to rotate it in y. Next scale it a bit, again the tool for scaling is on the tool bar directly under rotate. Now reshape it. Be careful how much you reshape, subtle differences are quite noticeable. This procedure is repeated as many times as required to create the shape you're after, each time duplicating the rib you most recently reshaped. For the sake of this lesson 5 or 6 ribs are sufficient. Also, if you like, the ribs

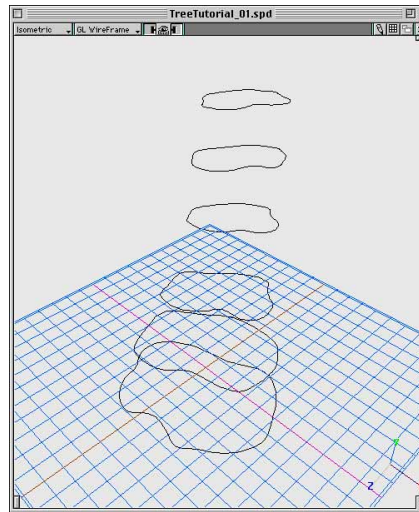


Figure 1

can be rotated along any other axis to form shapes that bend, just keep in mind what it is you wish to create, you might be better off using a path extrude which we will cover later. Your final set of ribs should look something like this (Figure 1).

Tip

To ease your reshaping process try switching to a top view and changing your view settings to “orthographic.” Do this with the little eyeball slider at the top of your modeling window. Also, use the magnifying glass tool from the tool bar to zoom in and out, option to zoom out. Double clicking the tool allows you to set the zoom amount; it defaults to 50% which is a little extreme.

Next, we’ll use the skin tool to give the object a surface. The skin tool is one of the extensions for StudioPro and is accessed through the extension window. If the extension window is not visible you can bring it up by clicking on the little plug icon in the upper right corner of your monitor. Make sure your modeling window is set to shaded view, upper right hand corner of the window, either flat or smooth. Select the skin tool by clicking its icon. Now click and drag from your 1st rib to your 2nd rib. You’ll notice

that the ribs highlight in red as they are skinned, this is important as skinning order is crucial and it is easy to make mistakes when your ribs are very close together. Also, it is good to know what direction to skin as the UV mapping is affected by direction, you don’t want your texture maps to be upside down. Continue skinning your object by clicking and dragging between ribs. Your skinned object should look something like this (Figure 2). Now if you are happy with your shape great, but if you see that a change is required, no problem. To unskin the object or just a section of the object use the unskin tool, just under the skin tool and click and drag directly on the object where you wish to unskin it (Figure 3). You can

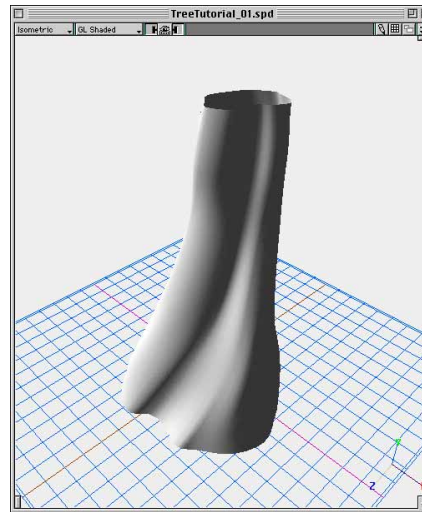


Figure 2

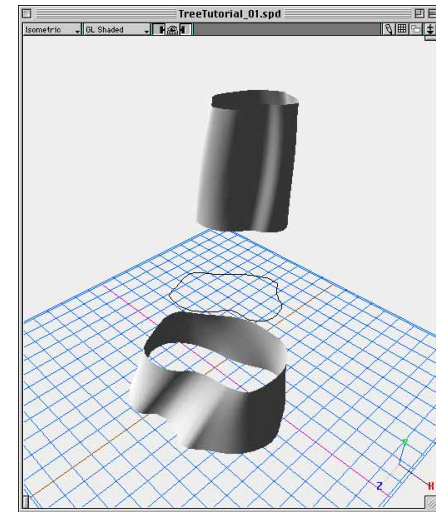


Figure 3

then select that rib or ribs and reshape them as needed. When finished use the skin tool again to re-skin by clicking and dragging.

Tip

Before we move on, it is important that you understand the Environment pallet. This is where you will find the lights tab. On the lights tab you control one of StudioPro's lighting types, parallel lights. These lights exist at an infinite distance and cast parallel rays of light. You can click directly on the light itself inside the gray circle, and drag them around. You can delete and add lights as you wish. You can control the intensity and if the light casts a shadow. You can also give the light color. These lights are very important to the modeling process. As you switch views you'll find your shapes dark and unclear; use these lights to make sure you can see your model from any angle.

Now we will create another branch using "instancing" and the same technique as above. First we need to set up our new shape window which is done from the "resource pallet." If the resource pallet is not up, bring it up by clicking on the little screw icon just above the extensions icon in the upper right corner of the screen. The resource pallet is where all textures, materials, shapes and special effects are held. Click on the "Shapes" tab, now

click on New and name the new shape "Branch." You're now presented with a new modeling window in which to work. Everything you create here will be part of that new shape called branch. Keep in mind that it is a good idea to save very often. If you haven't already, be sure and save your new project; the name is not important - call it whatever you like. We are going to create the new branch in its proper orientation so hit your x key to make the x grid active. If the grid does not change, hit y then hit x. Now just like before, using the pen tool create a rib to your liking on the x grid. Duplicate straight out along the x axis and then reshape it. Repeat this procedure until you've about 6 ribs extending along the x axis, only this time do not rotate the ribs (Figure 4). Now we need to properly position the ribs relative to each other.

Tip

When working in 3d it is often difficult to see clearly the special relationships between shapes from one view and difficult to

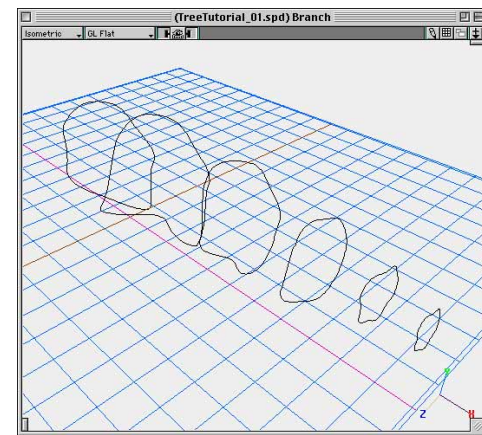


Figure 4

move objects if their control handles are obscured. Use the view move and rotate tools to better orient yourself with your scene. They're the first two tools on the tool bar on the left. Clicking on them brings up the view management controls; click and drag to move your view in and out or around your scene. The view rotate tool allows you to rotate your view, very helpful when attempting to position elements.

Another Tip

When moving or rotating elements within your scene remember that using the red control handles negates the need to have the proper grid active; however, if you simply click on the object in a random place and drag it, it will constrain to the active grid.

See [Figure 5](#), this is the basic configuration we want for our ribs. Use the object move tool to reposition the ribs something like this. If need be move your view around to get a better angle for grabbing the control handles on the ribs. Next we'll rotate the ribs to get them aligned better for skinning. This is why we did not rotate the ribs as we made them, it would

have made the positioning of them much more difficult. I use the view rotate tool extensively for this process, it really helps you to get a better view of the relationships. Also, feel free to move the ribs as well, whatever it takes to get them into the position you want. You should have something like this, ([Figure 6](#)). Now if you like you can add that twist by rotating the individual ribs around their own y axis by using the rotate tool on the corners. You might find that the center of the ribs is off center. This is caused by all the reshaping. Go to Modeling/Re-Center to reset the center point to fix this. We are now ready to skin the branch. Just like before use the skin tool to skin the branch. Once you have a skinned shape you may need to go thorough several skin/unskin rounds to get the ribs in just the right place and with just the right scale

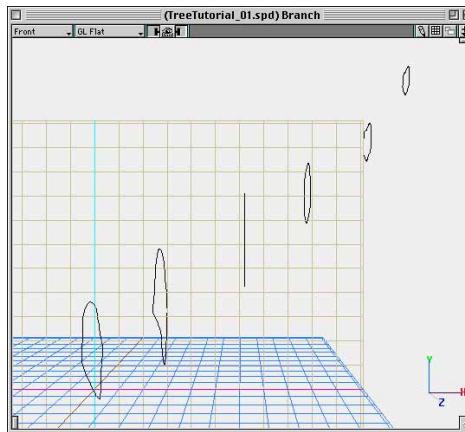


Figure 5

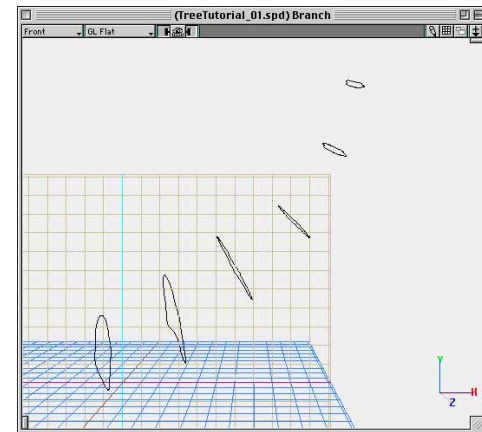


Figure 6

(Figure 7). In this example I went through several revisions on the ribs.

Now that you've completed the branch close the branch shape window, the shape is saved. Click on the main project modeling window with your tree base in it. From the resource pallet click on the "insert" button to insert the branch you created into the main modeling window. Using the move, rotate, and scale tools to position the branch how you like. Remember to switch views from front to top to isometric, getting the best angle on your scene. Also use the view move and view rotate tools for custom view changes. You might decide that you need to further adjust your tree base as I did to make it work better with the branch. Also, you can insert as many branches as you like into the scene as they are instances (Figure 8).

With the tree base and branch models complete we can work on texture mapping the tree. There are lots of options here and we have to give thought to what type of environment the tree exists in and what type of surface you see it having. For the sake of this tutorial let's assume the tree exists at the water line of a pond or stream. Let's also assume it has a

smooth surface like an aspen or other tree without heavy bark. I've created many textures that can be found on the enclosed cd. Look in the directory "Frank Vitale" for all files related to these tutorials. Keep in mind that it is not imperative that you go out and photograph a specific tree to capture the surface you want. It certainly does help when creating "photorealism" but is not required for every creation. Here is used instead, a photo of "fence slats" for the tree texture. You can see the original photo in the "photos" folder. In Photoshop I cleaned up the spaces between the slats, removed some knots, made the texture wrap and changed the color. I liked the break-up of this photo with the dark areas in contrast to the light and though it would work well for

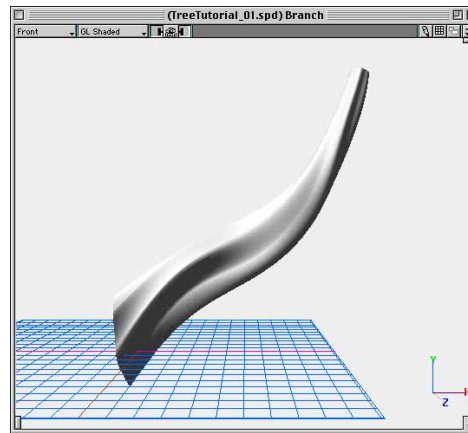


Figure 7

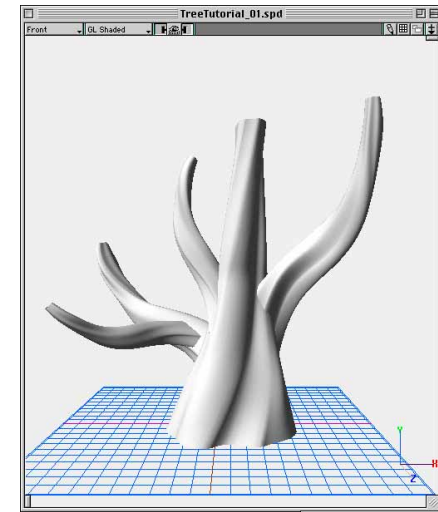


Figure 8

a tree in a wet environment. I've already developed all the materials you will need for these tutorials, they can be found in the "saved materials" folder. Go to File/Import to import materials into your project. Do that now and import the material "TreeWrap." The material will appear on the texture tab of the resource pallet. Double click on the texture on the tab and the surface texture edit window will come up. It is within this window that all the image maps and attributes are applied to a given material or surface texture. Click on the "map" button or in the mini texture window directly above it to load a texture. We already have the texture map "TreeWrap_RGB" loaded here.

Tip

When saving textures in Photoshop it is a good idea to give them an extension so you can better organize and keep track of them. I use an extension like _RGB or _BMP for the different types of maps. RGB = color map, BMP = bump map, OPA = opacity map and so on.

You will also notice that there is a texture loaded in the bump channel. This texture is named "TreeWrap_BMP" and is a gray scale file. It is a good idea to use gray scale maps for all channels other than "Diffuse Color" (same as map) and "Specular Color" all the other channels use 8 bit and less. If you do put a color map into one of these other channels it will simply be converted into a gray

scale image. Please see the section immediately following this one, [The Surface Texture Editor](#), for a complete description of all its features. For now let's apply "TreeWrap" to the tree.

Close the Texture Editor window by clicking cancel and go to the project window. Expand the group "Tree" by clicking on the blue arrow to its left. Expand further the Base Properties section revealing all the elements of the tree. We want to apply the texture to each part separately for the most control. Apply a texture by simply selecting the shape you wish the texture to be applied to and clicking on apply from the resource pallet. Also, you can simply drag the material directly onto the shape in its modeling window. When you do this you'll notice the shaded shape has changed color to reflect the new texture. **With "OpenGL" shading you can have StudioPro display more than just a shaded view of your object.** Go to Edit/Preferences and click on the windows tab; click "Show Textures" and close the window. Now your shaded view will actually show your textures in real-time. The texture placement will update in real-time as you adjust the mapping coordinates, which we will now do. Bring up the object properties pallet and click on the texture tab with your object selected. If the window is not expanded click on the little blue arrow in the lower left corner to expand it. The little sphere tells us that mapping is set to UV, which is what we want.

Click on it to see the other mapping options. The tiling and mixing is set correctly as well. Mixing is used when more than one texture is applied to an object, click on it to see the options available to you. We now want to adjust the amount of coverage used. The default is 100% in X and 100% in Y. X would be around the circumference of the tree or U. and Y would be the length of the tree or V. Make sure the radio button for coverage is clicked and set them both to 50%. Feel free to experiment with these settings to your liking. Now with the render camera at the bottom of the tool bar, select “RT Best” from the popup window and drag a marquee around a portion of your tree to render it out confirming that texture placement is to your liking, (Figure 9). Now using the same method apply the texture to all the other branches, experimenting with different coverage settings so not all the branches look alike. As you drag the tree texture to the various branches you might find that the mapping defaults to “planar,” if so simply use the popup menu next to the sphere on the object properties pallet to set it UV. On the smaller branches you might want to set the X coverage value higher than 100 as that is a lot of texture map to squeeze onto a thin branch. I’ve found that 150 and even 300 work well for smaller branches. Your render should look something like this (Figure 10). We will now add

the water line to the tree so that when we add the water it looks more natural. The idea here is that at the water line the tree would get wet making it more specular and darker, also algae might grow on the surface of the tree in these wet regions. We will use “Stencil mapping” to add this algae. **Again go to Import and bring in the material “WaterLine.”** Double click it on the resource pallet and have a look at the various texture maps associated with it. For the stencil map the white areas will show the texture and the black areas will be fully transparent. Close the window and drag the waterline material to the main tree shape, remember that your “tree” group needs to be expanded in the project window to have the mate-



Figure 9



Figure 10

rial applied to just that one shape. The material should default again to UV, this time we will change it to planner, do this now and set your tilling to “none.” Setting the tilling to none you’ll notice the tree looks to be shaded white under the waterline material. Don’t worry about this. The render will still show the tree texture beneath. We now need to place the texture properly. On the object pallet click on the “position” button, if it is not available it could be that your modeling window is not active. If this is the case click on the title bar of the modeling window to make it active. Clicking on the position button will reduce the tool bar to the necessary tools for positioning the projector or mapping coordinates. The available tools include: move, scale and rotate for the projector and the standard view and object manipulation tools. Using the projector tools, the 3 bottom ones, position the planner projector like this, (Figure 11). When you’ve finished aligning the projector click

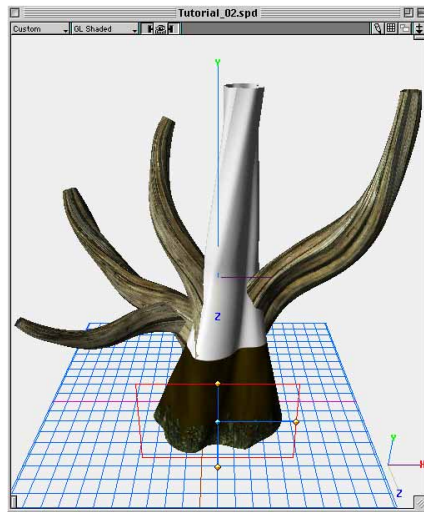


Figure 11

on the end reshape button, the little hemisphere at the top of the screen. This technique of stencil mapping is very useful for layering of textures and can be used to hide those unsightly intersection points.



Figure 12

The Surface Texture Editor

This is the Surface Editor (Figure 13). It is used to create all surface textures in StudioPro. You can create materials that change over time or ones that are constant. The animation controls are at the top of the window. Texture maps are loaded into the various channels to create the desired effects. Most of the channels use gray scale maps with the exception of 2, the Diffuse color or Map channel and the Specular color channel. When gray scale

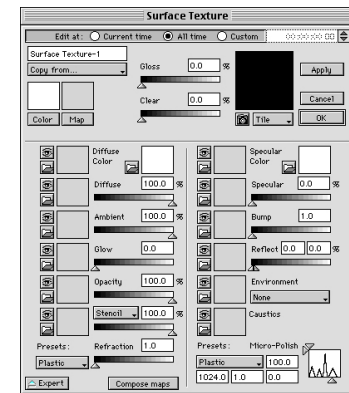


Figure 13

maps are used the white area of the map can be thought of as reactive and the black as non-reactive. All the maps are fairly standard: Color, Diffuse, Ambient, Glow, Opacity, Stencil, Specular Color, Specular, Bump, Reflect, Environment, and Caustics. There are a few things to point out in regard to how StudioPro handles these texture channels. With the Stencil channel you have the option of having the stencil be transparent or have white behind it. If it's transparent it will either cut a hole in your object or reveal an underling texture. Under Reflect you have a great deal of flexibility. First, you can use a map to determine what areas are to be reflective and which ones are not. Also there are 2 sliders, one for 1st reflectivity and one for 2nd. These are used to simulate the effect of angle on reflective surfaces. Think of the 1st reflection as how reflective an object is when viewed straight on, like looking down from above into water. The 2nd slider controls how reflective a surface is when viewed at a steep angle like looking out over the water toward the horizon yielding a much greater reflection. Reflectivity is object to object interaction, it's separate from reflection maps. That is where environment comes in. Again you can use a map to determine what is reflective and what in not. Also, you can assign an environment to be used as the source of the reflection. Environment are created and manipulated from the resource pallet. Finally, there is caustics. Caustics is the effect seen as light passes through

an object such as the surface of a pool or a drinking glass. The pattern that is created at the bottom of the pool or on the table is simulated with a caustic map. Any light shining through a transparent object using a caustic map will cast that map's shadow. The refraction slider also controls how light behaves as it passes through objects. There are several presets but any value between 1 and 2 is allowed. Directly below refraction is "Compose maps" a very useful tool that allows you to adjust the placement and orientation of the individual maps used. If the texture you've created in Photoshop ends up being upside down when applied to your object and rendered, you can use this feature to rotate the associated maps.

The final section of the surface editor I wanted to talk about is "Micro Polish." This is an extremely powerful tool and requires some attention to detail. Basically micro polish allows you to create a complex specular highlight that has 2 components instead of just one. There are several presets that can be used but I almost always end up creating my own. In a nutshell, this is how it works. First off the specular slider controls the brightness of the specular highlight so I usually crank this all the way to 100 when working with micro polish to clearly see what I am creating. I also disable the bump map if I am using one so the relief doesn't interfere with the highlight.

OK, so the first input field for micro polish determines the size of the main specular highlight. High numbers here give you a tight highlight, such as a very shiny object like a pool ball. Decreasing this number will increase the size of the highlight. The second input field controls the size of the secondary specular highlight, think of it as a halo around the first highlight. The next 2 fields to the right control the brightness of both of the highlights. The top one controls the primary highlight and the bottom one controls the secondary highlight. These 2 numbers are linked together and controlled with the slider at the top of the small box to the right. You can over-ride the slider settings though by using the numeric input fields (Figure 14). This figure shows the different effects that can be achieved through micro polish. Sphere 1 is set to: 700, 1 and 100, 0. This gives us a hard edge tight specular highlight. Sphere 2 is set to: 700, 20 and 60, 40. This keeps the hard edge, tight highlight and adds a soft halo around it. Sphere 3 is set to: 300, 16 and 35, 65. Also, texture maps have been added to create a metal surface. The material is convincing and the weight of the object can be felt. Changing the micro polish settings has yielded a larger primary highlight and a larger sec-



Figure 14

ondary highlight. Get a firm grip on micro polish. You'll be glad you did.

Tutorial 2 - Grasses

The next object or set of objects we will cover are the grasses. In this scene we basically have 2 different types of grasses (not counting the grass atop the mounds or hills) that we will cover in the tutorial for the hills. For now we will focus on the reeds and the green grass you see growing up around the tree base and near the dock and stairs. Grass has always plagued designers as being a very difficult thing to create and have look natural. In large, grassy areas the general idea was to use texture maps on flat planes or on undulating terrain meshes. This worked OK for viewing from a distance but once you were up close on such an object the suspension of disbelief was quickly lost; the shadow and shape just was not

there. What is needed is a combination of flat texture mapping for distant objects and actual 3d grass for anything up close or even in the middle ground. With the use of instancing you can create quite large areas of grass that are fully modeled without taxing your memory.

If your Tree project is still open great, if not, go ahead and open it. If you did not do the tree project don't worry; just create a new project in which to work. It is a good idea though to at least read through the tree tutorial as many tips and techniques on operating in StudioPro were presented. By the time we reach the end of the tutorials a complete scene will have been created. The way in which we will model the grasses are similar to the way we modeled the tree in that it will be a skin object. The difference is, it will start out as a path extrude object and then be converted into a skin object. Working as a path extrude object allows us to create a fairly complex path that would take too long to create solely as a skin object. Before we start creating the grass let's organize our project a bit by naming the tree parts and grouping them under one name. If you are not working in the tree project, you can skip this step.

If it is not already up bring up the Project window by clicking on the little film strip icon in the upper right of your screen. This is the window where you can access all your objects and key frame animations. Select one of your objects, say the tree base and expand it within the project window by clicking on the blue arrow. The first input field is Name: go ahead and type in a name like "Tree Main" and hit enter. If the name doesn't take add a space after the name and then hit enter. Click on the

arrow again to collapse the attribute list for Tree Main. One at a time select and name the other branches within your project in the same way. After all the objects have been named shift click to select them all within the project window and go to Modeling/Group to group them all together. Now name this group "Tree." There you have it, all nice and organized. You can still access all the shapes by clicking on the arrow next to Base Properties.

Tip

When selecting objects from the Modeling window the group they belong to must be expanded showing their names to select them individually. This gives you great control over what objects get selected as your projects grow.

Now on to the grass. If it is not already up bring up the resource pallet and click on the shapes tab. Hit the New Shape button and name it "Blade of Grass." You now have a new empty shape window. Hit the Z key to activate the Z grid, this is the grid where we will create our path for our blade of grass. Don't be too concerned with scale at this point; we will scale the grass down later. Now with the pen tool lay down a path similar to the one you see here (Figure 15). (If you need to review the pen tool, please refer to the tree tutorial.) Use reshape and switching of views to adjust the path to your liking. Re-

member, to end an open Bezier line and leave the pen tool, all you do is click on another tool such as the object move tool. Next, we will create the profile of the path extrude object. Hit the Y key to make that grid active and using the pen tool in association with the reshape command create an open Bezier line something like this (Figure 16). To create this shape you will need to break the middle vertex so you can have the curves at steep angles, option drag on handles to break. Now that you have the path and the profile, use the Path Extrude tool to create the extrude shape. If the extensions pallet is not up bring it up by clicking on the little plug icon, upper right of the screen. Select the path extrude tool and just like with the skin tool, click on the profile, hold the mouse down and drag to the path and release; the profile is extruded along the path you created. It should look like this (Figure 17). Great, now we need to convert it into a skin object so we can create the taper and make it look like an actual blade of grass. Select the object if it is not already and go to Modeling/Convert... and select Skin. You can also use the convert button at the top of the screen

- it looks like a sphere with a box around it. Now you've got a skin object, next step is to unskin it. Using the Unskin tool from the extensions pallet, click and drag on

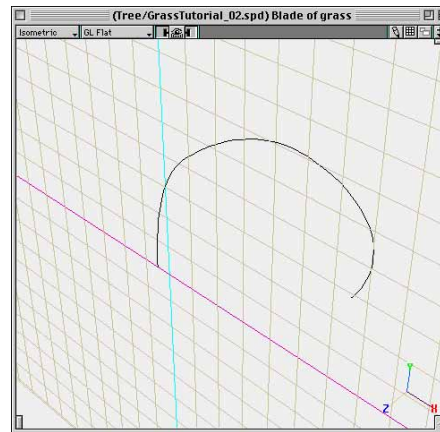


Figure 15

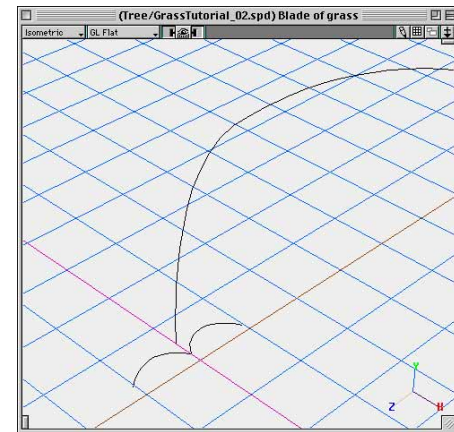


Figure 16

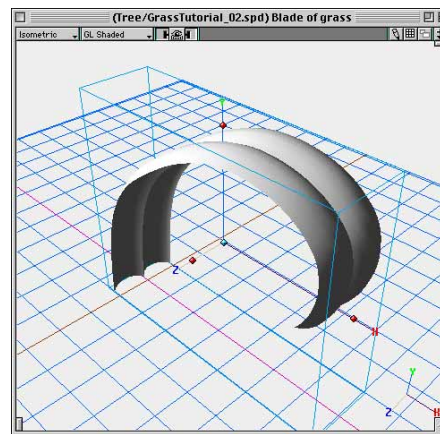


Figure 17

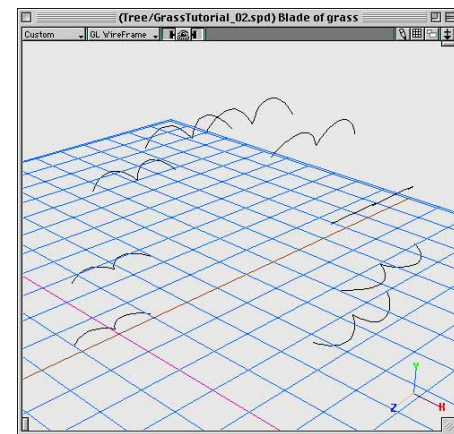


Figure 18

your object to unskin it and reveal the ribs. Depending on the complexity of the path you created you will either have a few ribs or way more than necessary. In this example I deleted every other rib to simplify my object (Figure 18). Now we need to scale the ribs so that the tip tapers. I like to see to it that by the time I get to the end the last rib is scaled down to about 10%. The amount you scale them is up to you depending on the look you're after. In your shape modeling window click on the 2nd rib from the base, now from the Windows menu bring up the Object Pallet if it is not already up. Click on the Transform tab and click the blue expansion arrow in the lower left of the window. Now click on the radio button next to the scale icon and click on the little pad lock to lock all 3 axis together. Select the Percentage radio button and double click in the field next to X to highlight it. Type in 90 to scale that rib down in X, Y and Z 10%. Now select the next rib and type in say 80 to scale it down 20%. Work your way down the length of your object scaling each rib down more and more until you reach the end and around 10 % for the final rib. Now that you have scaled down all the ribs use the skin tool to patch the ribs back together again, clicking and dragging from rib to rib starting from the base and working your

way to the end. Your final skinned object should look something like this (Figure 19). There you have it, a curving blade of grass. Now we need to create a couple other blades of different shapes and sizes that we will insert into a new shape window called Patch of grass. So now close this shape window and click on the new shape button on the resource pallet calling it Blade of Grass 2. Within that window create another blade with different proportions. Do this one more time calling it Blade of Grass 3. What you want to end up with is something like this (Figure 20). What I've done here is create my 3 different blades of grass and insert them into a new shape called Patch of Grass 1. If at this point you decide that you would like to make changes to any particular blade of grass do so on its shape level, within its own window.

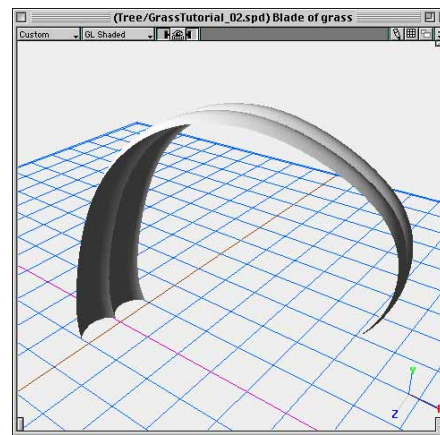


Figure 19

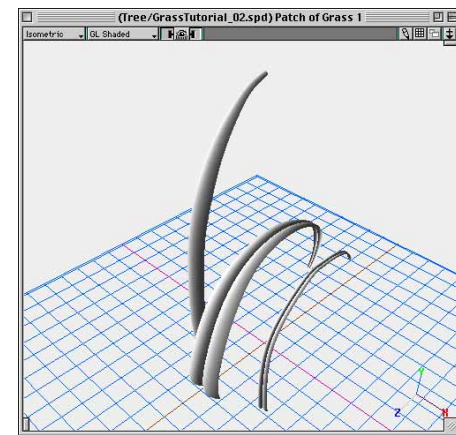


Figure 20

You can bring up a shapes window simply by double clicking on that shape wherever it may be. Now insert 10 to 15 of each blade of grass into your new shape, Patch of Grass 1. Using the move, rotate and scale tools position each blade in a natural manner. It is a good idea to try and group blades together similar to the way grass grows naturally. It can be a bit tedious placing 30 - 50 blades of grass, but stick to it and the results will be worth it. Patch of Grass 1 should look something like this (Figure 21).

Now we need to texture map the blades of grass. Again, if you didn't go through the 1st tutorial, you should at least skim over the section on texture mapping to familiarize yourself with some of StudioPro's surfacing tools.

When you're ready, go to File/Import and from the saved materials directory load "Grass 1" and "Grass 2". Drag these textures onto the primary shape level of your 3 different blades of grass. Alternatively, if you decided that you needed to have more than 2 different texture maps you could assign the materials on the "Patch of Grass 1" level,

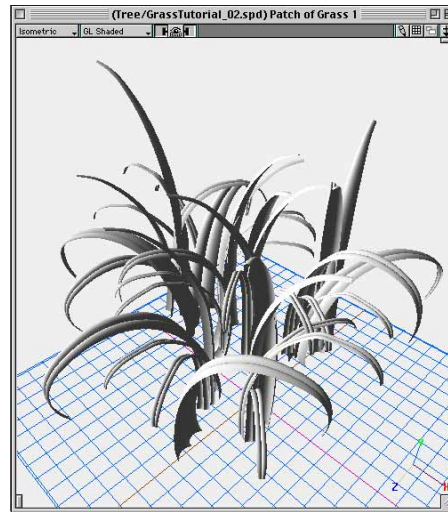


Figure 21

that way you could have a slue of different texture maps on similar objects. Since we have sufficient variety in the models and in the placement there is really no need for more than 2 materials. The materials will default to UV which is the proper mapping method for these objects. That is about it, your rendered patch of grass should look something like this (Figure 22).

Your patch of grass is ready to insert into your scene, its placement is up to you but you might want to wait until you complete the next tutorial, "The Hillside." Now is a good time to add a flat plane to the scene which will eventually be water. This water plane will be made com-



Figure 22

pletely opaque so it will not need to be very high on the tree to be effective. If we were going to make transparent water we would have to create not only more tree preferably with roots and all, but the bottom of the pond also. For this lesson we'll just go with opaque water, and just make it really scummy, like pea soup. With your tree project open go to an isometric view in the main modeling window and drag out a flat plane on the Y grid. The flat plane tool is 9 down on the left side of the tool bar. These 2D tools, there are 3 of them, all have 2 sides, one is a simple outline and one is solid, be sure to use the solid side. Don't worry about getting the shape perfect with the tool, it's much easier to use the move and scale tools to size and position the flat plane exactly where you want it. Your flat plane should look something like this in your scene (Figure 23).

The reeds are created the exact same way as the grass. The only exception is a circle is used as the object to be swept along the path not an open Bezier line. When grouping the various reed stalks into a reed patch it's a good idea to have straight stalks in the center and curving stalks toward the outside (Figure 24). As

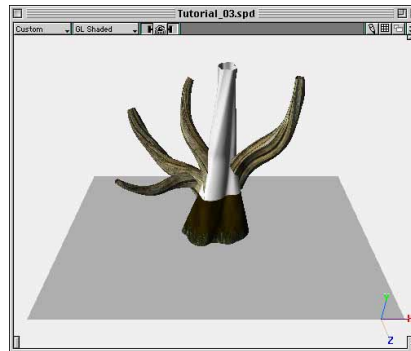


Figure 23

far as texture mapping the reeds load the saved materials Reed 1 and Reed 2 from the saved materials directory and apply them to the reed stalks just as you did with the grass above.

After you've completed inserting all the grass and reeds to your liking you should group them together to keep your project window from getting too crowded and to make it easier to turn them on and off as you progress. To group the object select them within the project window by shift clicking on their names and then make the modeling window active by clicking on its title bar. Click the group icon at the top of the screen or go to the Modeling/Group menu. In the project window expand the group you just created by click-

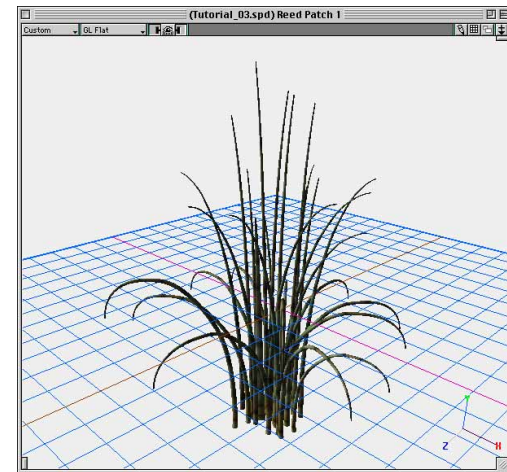


Figure 24

ing on the small arrow to the left and name the group. Do this for both the grass and the reeds separately.

Tutorial 3 - Hillside

Another major element in the scene is the grass topped hills. They surround the tree and add a mood to the scene. They are also a place to add small detail like the roots of other unseen plants. They are quite simple to create using the skin tool. They could also be created using the path extrude tool or by simply converting a flat plane to a Bezier mesh and adjusting. I like the skin tool approach as it is a clear modeling technique and easily adjusted. For the sake of this tutorial we'll use the skin and the path extrude tools.

As before we will create the hillside as a shape, that way if you wish to have more than one in your scene you can with minimal memory usage. So, from your tree project or from a new project create a new shape and name it "Small Hill". The first thing to do is to create the cross section or rib using the pen tool. The shape

is up to you. What I've created is a shape that will curve off nicely both left and right and has a bit of a depression or indent for the tree. Remember that when using the pen tool its handles can be broken by using the option key on your keyboard. Conversely, if you've already broken handles they can be realigned by clicking on the "align handle" tool, it's the 3rd icon from the right at the top of the screen. If you're unclear on the use of the pen tool please refer back to the tree tutorial. Your first rib should look something like this (Figure 25).

The amount of ribs you duplicate along the Y axis for skinning depends on the amount of variation you'd like in the vertical. Keep in mind that you will want to have fairly even distribution of ribs to keep the texture map from distorting with UV mapping. Duplicate the rib you

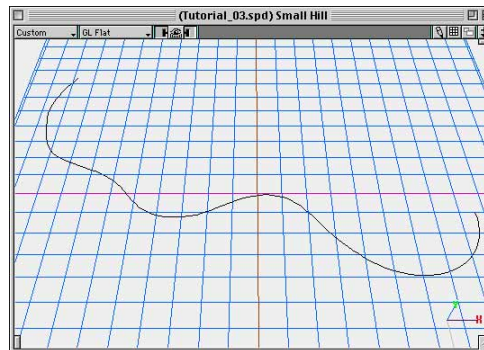


Figure 25

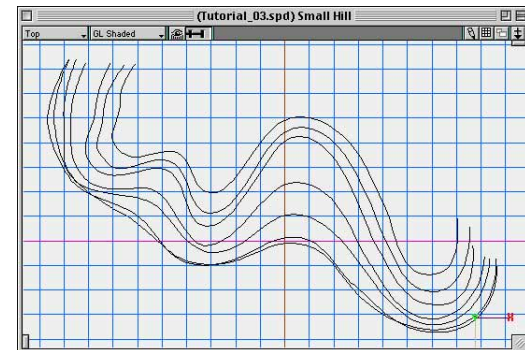


Figure 26

created by holding down the option key and dragging the center or Y handle. What I've done in this example is to make the 2nd rib overlap the 1st rib to create a bit of an overhang of the bank over the water. I continued to duplicate ribs along the Y axis each time using scale and reshape to get to the shape desired. Switching views goes a long way toward making this process much easier. If you look at [Figure 26](#) the top view, you'll notice that it kind of resembles a topographical map. If you think along these lines creating land masses with skin objects will make a lot of sense. Looking at [Figure 27](#) you'll notice I've also adjusted the ribs in the vertical to add a bit of rolling to the hill. You can work from a front view or isometric or whatever works for you as long as the proper grid is active, either Z or X. [Figure 29](#) shows the hill shape in a shaded view after it has been skinned. Use the skin tool as you did in previous tutorials, clicking on a rib and dragging to the next. Shapes like this one at times are more difficult to skin properly, be sure to watch which rib highlights in red as you proceed through skinning. If you find that the skin tool keeps wanting to use rib 1 when you are skinning rib 3 and 4 try changing your view a bit and skinning from the back or inside of the object.

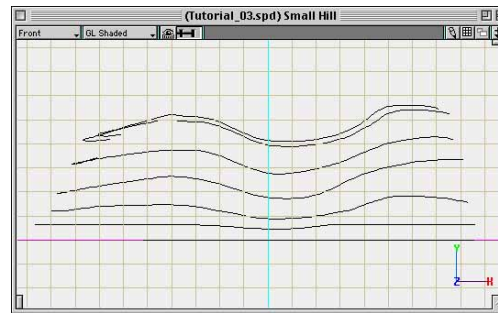


Figure 27

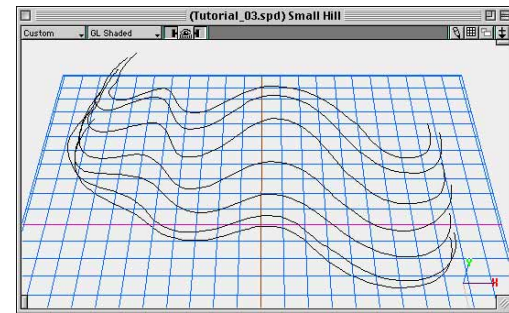


Figure 28

Now that you have the main portion of the hill, it's time to create the grassy top. We will use a path extrude object for this shape and we'll map it with a stencil map. Don't confuse stencil map with Opacity map. With an opacity map it is not possible to achieve 100% transparency. Opacity maps effect the way light passes through an object and need to be used in conjunction with, diffuse, ambient, and specular maps to work properly. Whereas stencil maps simply cut away at the object without the need for any other supporting maps. The first thing to do is to create the path for the extrusion. From an isometric view use the unskin tool to unskin just the very top section of the hill. Then select the top rib and with option drag, copy the rib moving it vertical along the Y axis, then reskin the top rib. You now have a path for the extrusion that perfectly matches the top rib of the hill ([Figure 30](#)). Next we'll create the profile of the extrusion. Using the pen tool create a Bezier line something

like this, (Figure 31). I've shown this line in reshape mode so that you can see the starting point is at the bottom of the line. This is very important as where you start will affect the way the path extrude object is created. Also, notice that I am at the right side of the path, that too is important and will affect the final shape. After you complete the profile go ahead and use the path extrude tool from the extensions pallet and create the path extrude object by clicking on first the profile and dragging to the path. Your object should look something like this (Figure 32). I've scaled and lowered the object a bit to keep from having too much intersection with my hill object.

Our shapes are complete, we can now add the texture maps. Go to File/Import and bring in from the saved materials directory two materials, Grass Cap and Dirt Bank. Drag Grass Cap onto the shape you created for the grass. On the object properties pallet go to the texture tab and set the Y to 10%. This texture wraps and will repeat 10 times along the length of the extruded shape. I

had to adjust the orientation of the maps using compose maps under the texture editor as the texture was created as a horizontal texture not vertical. A quick snapshot and your objects should look something like this (Figure 33). Now do the same with the material "Dirt Bank." This time set X to about 20%. Since we are working with a skin object the orien-

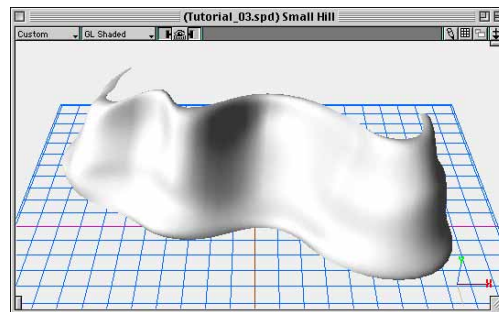


Figure 29

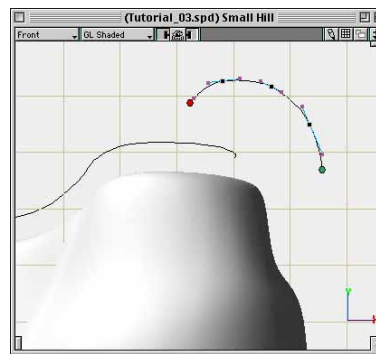


Figure 31

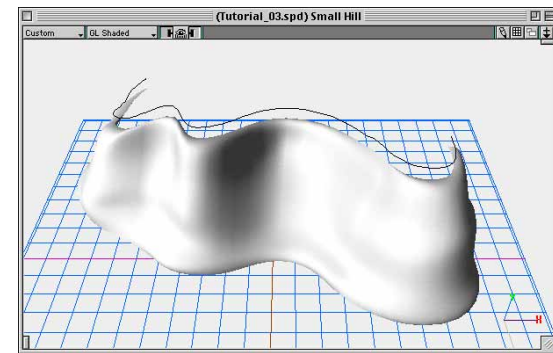


Figure 30

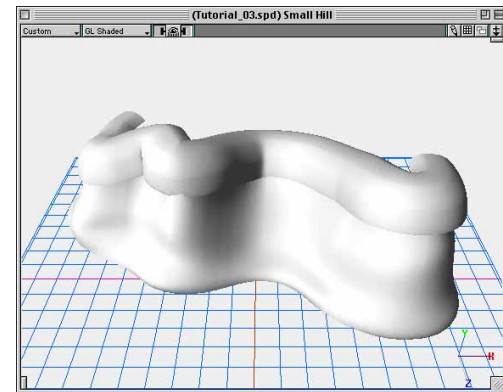


Figure 32

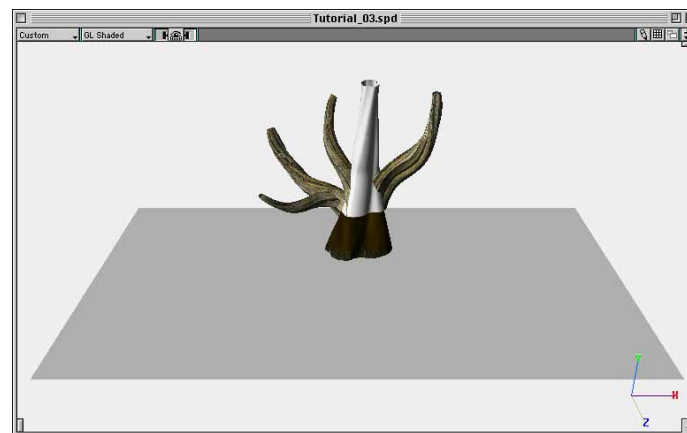
tation of the maps are correct, X is along the horizontal and Y is along the vertical. You might find though that the map is upside down all depending on how you created the skin object so now is a good time to work with “Compose Maps.” Look at [Figure 34](#) and if your map is indeed upside down double click on the material Dirt Bank and then click on the Compose Maps button. Here you can use the circle that is half gray and half white to rotate the individual channels of your material. Just click on the horizon line within the circle and drag it around. Be sure and do that for each channel; you can select them at the top of the window.

*Figure 33**Figure 34*

Tutorial 4 - Water and Algae

All of the detail in the water comes from the surfacing and the addition of the algae, the water itself is simply a flat plane. If you didn't insert a flat plane into your scene in tutorial 2 do so now. If you did, use the scale and move tools to position it like so ([Figure 35](#)).

The next step is to build the shader or material for the water. From the resource pallet click on the texture tab to bring it to the front if it is not already. Click on New... and select surface texture. In the Surface Texture window that comes up click on the color button and give your material the color of your choice, preferably something muted and dark, I've gone with a dark blue green

*Figure 35*

but use any color you like, we'll likely change it later. Where it says "reflect" set the first % field to about 20 and the second to about 50 and then for specularity set it to 100%. Name the material "water" and close the window. You'll notice we did not make it transparent. That is because as I mentioned earlier we will not be modeling below the surface of the water. Now click on the new button again and select "Extend Ripples." This is a plug-in for StudioPro that allows the creation and animation of ripples (Figure 36). Using this plug-in you can create shaders that will add the illusion of ripples to your objects either as a still or animated effect. You can add more than one ripple effect if you like. For example, you could have a random ripple effect, atop a linear effect, possibly caused by a boat rocking and then a circular effect from perhaps a leaf that dropped into the water. In addition, this plug-in will break up the way the surface reacts to diffuse light, great for making water look scummy or cloudy, and great for simulation depth. Have a look at Figure 37 and Figure 38 for the settings used for this ripple shader. The best way to arrive at appropriate settings is through experimentation. The values here require very subtle changes to alter the appearance of the image. **Both of these materials have already been created for you and can be imported from the saved materials directory.**

Now for the Algae. A quick and easy way to create such an object is through the use of a feature in StudioPro similar to John Knolls Cyber Mesh called "Import as 3D Mesh." From the import command under File you can import greyscale files as 3d geometry (Figure 39). Information about the pict file is seen at the top of the window. Below that are all the settings for converting that greyscale file into geometry. Seen here are the settings used for the algae shape. Clicking on the camera icon

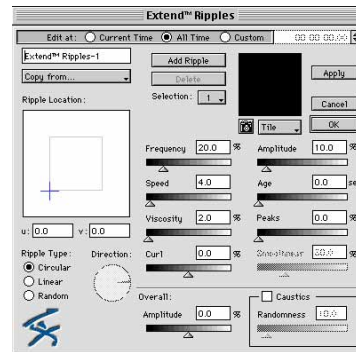


Figure 36

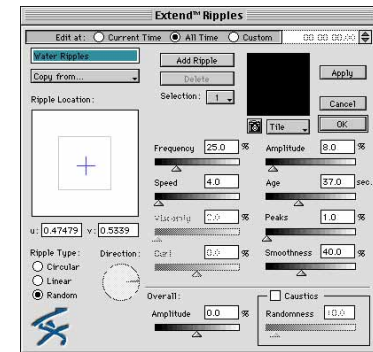


Figure 37



Figure 38

renders the shape with the current settings and clicking and dragging on the shape itself allows you to rotate it for better views. The important thing to keep in mind for shapes like this one is to keep the smoothing set quite high, otherwise you will end up seeing faceting on the shape where steep angles occur. **To create the algae shape import the file “AlgeCyber.pict” from the textures directory and input these settings:** Grid Divisions - 250 x 167, don't adjust the size and set the Height to .2 keep it set to Trimesh and Point Sample. Click the box “Don't make polygons for black pixels” and set the Smoothing around 70, smoothing can actually be cranked to 100, the entire object is to be smooth. Click the camera and your results should resemble these.

With your algae imported you next need to position and scale it to your liking. Using the rotate, move and scale tools position the algae so that the base of it is just barely below the water's surface with most of the shape visible above. The easiest way to do this is by first rotating it from an isometric view (use the shift key to constrain to 45 degrees) and then scale it to cover the area you wish to have covered, keeping it very flat in Y. Then switch to the front view, set your view slider to orthographic (the

slider with the eyeball) and set your view to wireframe, and turn off the grids, Edit/Hide Grids. Now you can see the line that is the water and the flat bottom of the algae shape. Drag it down in Y using the red handle so that the base is just below the surface. Using the magnifying tool to zoom in on the center of the shape makes selecting it much easier. Remember that “command =” will fit view to all objects and “command -” will fit to selected. Two very useful key commands to remember.

Note that if in shaded view it appears that your algae is below the surface of the water plane it is most likely not. When it comes to subtle differences in distance between 2 shapes sometimes the OpenGL shading can't distinguish between the shapes and it gives an inaccurate representation. The best way to be sure is to drag with the render camera, a quick snap shot of the area in question.

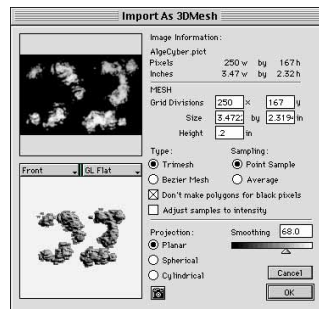


Figure 39



Figure 40

Next we'll apply an algae texture to the shape. **Go to File/Import and import the saved material "Algae Wrap"**. Drag this material from the resource pallet to the algae shape. Bring up the Object properties pallet and bring forward the texture tab. Click on position and scale down the projector to cover about 1/3 of the shape. Hit the end reshape button at the top of the screen and that's it, you're set. Take a snapshot of your scene and it should look something like this. (Figure 40).

Tutorial 5 - Building the Scene and Inserting a Camera

Now that we have a surface from which to work we can proceed with inserting the hill shape and inserting some patches of grass. The placement of these objects is up to you. You can scale, move and rotate them to your liking. One of the good things about shape objects is with an object like the grass you can insert say 5 iterations of the shape into your scene and then scale them different values in Y to give

the appearance of multiple different objects. Go ahead and insert the other objects into your scene by bringing forward the shapes tab on the resource pallet selecting the shape you wish to insert and clicking on the insert button. As your scene gets larger the screen redraws are going to get slower. What I generally do is set my view to point cloud or wireframe, make my changes and then switch back to shaded view. This is also a good time to insert a Camera into the scene. Up to now we've been working with the standard modeling window which is quite flexible and is sufficient for most views of any given scene. For final renders though it is best to use the camera window. Studio Pro allows you to insert as many cameras as you like. The cameras are fully editable and most of all their parameters can be

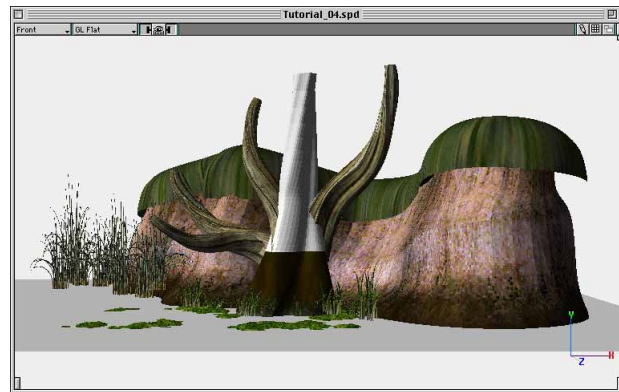


Figure 41

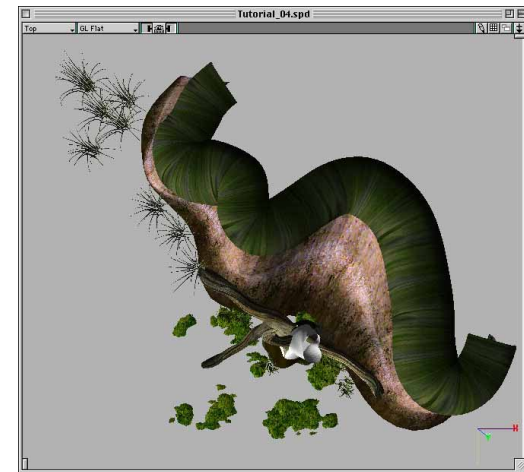


Figure 42

animated. Have a look at [Figures 41](#) and [42](#), this should give you an idea of how to place your grass and reeds into the scene. Remember you can always move elements around to suit your needs. Feel free to change the water level, the placement of the hillside or the tree and algae.

Next for the camera. The camera is inserted into the scene using the camera tool, it is the 3rd from the bottom on the left side of the tool bar. Simply clicking once with the camera tool in your scene will insert a camera. You can also click and drag if you like. The first click sets the camera's reference point and then dragging positions the camera body. Once the camera is in your scene you can make all the fine adjustments to its position. For now from the front view of your scene, set to point cloud to speed things up, click once with the camera tool to insert a camera. The camera appears outlined in red with a black body. The default is the camera pointing left so switch to the top view and by clicking on the body, position the camera so that it is pointing forward and by clicking on the reference point, position the camera so that it is oriented something like this ([Figure 43](#)).

Tip

You can click on the reference point to move just it; the camera body to move it; or the redline connecting the two to move them together. Be extra careful when moving the reference point as dragging it over an object will highlight that object in red and then attach the camera to that object. To avoid this simply hit and hold the option key down after you have clicked on the reference point. The object will then highlight in green signifying no attachment is being made. If you hit option before clicking on the reference point you will copy the camera. If you do accidentally attach the camera to an object simply go to the camera object properties pallet and under target select none.

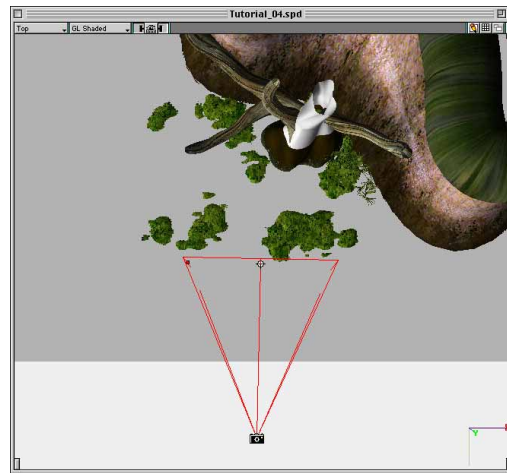


Figure 43

The fine adjustments we will do in the camera window itself, for now have a look at the Object Properties pallet with the camera selected. You can select the camera either in the main modeling window or the Project window ([Figure 44](#)), This is the Camera's Object Properties. This is where you can set the depth of field, view angle, motion blur, targeting and tracking info and more. Many of these commands

can also be accessed through the project window. Now in your modeling window, with the object move tool, double click on the camera body. This brings up the camera view window; it is here that you can make all the fine adjustments to the camera position (Figure 45).

Tip

At times you might notice that the windows don't want to redraw. If this happens you will see a yellow pencil at the top of the window toward the right side. Clicking this pencil forces a redraw of the window.

The arrow icons at the top of the camera window allow you to move the camera about its reference point. If you wish to move the camera and the reference point, use the set of arrows in the upper right of the camera win-

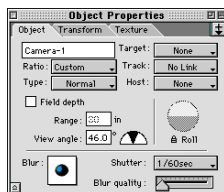


Figure 44

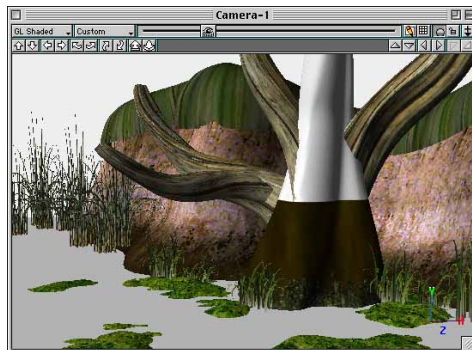


Figure 45

dow. Again, it is best to keep the view set to point cloud to speed redraws when adjusting the camera. The slider at the top of the window affects the view angle of the camera and if you like you can choose from a list of presets directly to the left. If you decide you would like to play with field of view, the way it works is the number you input in the range field on the camera object properties pallet will remain in focus both in front of and behind the camera's reference point. You also need to be sure Field depth is checked (Figure 44). Depth of field is best saved for situations when the camera is very close to an object or the scene is a very small one such as a fish tank. Figure 46 makes the scene look like it is a miniature environment.



Figure 46

Tutorial 6 - Lighting

The next issue to take into consideration is lighting. All too often overlooked lighting is a very important aspect of any scene and can make or break all your hard work. It would be quite easy to write page after page on this issue alone as there are so many variables to consider. I will stick with the basics for this tutorial.

Up to now we've been working with the default lighting model. It consists of a setting for ambient light and a single parallel light. Both of these lighting types are accessed through the Environment Pallet. If this pallet is not up bring it up by clicking on the yellow circle or sun icon in the upper right of your screen (Figure 47). We touched on this earlier in the tutorials, but I'll now go a bit more in-depth. The gray circle on this window represents the scene and the line with the circle on the end represents the direction the parallel light comes from. Think of parallel light as sunlight or a light source at an infinite distance, it covers the entire scene. You can select this light by clicking on it and dragging it around. As you change views in your modeling window those changes are reflected here. You can change its intensity, add color and specify if it casts shadows. You can also delete the light or add as many as you wish. I use this light type when modeling, but rarely for final renders unless the scene is quite large such as expansive outdoor scenes.

You can also adjust the ambient light from this pallet. Clicking on the ambient button will bring up a color requester where you can change its settings. One of the big mistakes made very often is setting the ambient light too high. Think of the ambient light as how bright it is in the deepest shadows, which in the real world is very dark. For this scene set your ambient to about 6%. You can also set a color for this light type handy for simulating night scenes with a bit of blue. Go easy on color though as a little goes a long way.

For this scene we will not use a parallel light but we will use 3 spotlights. One will act as our main or fill light, one will act as our bounce light simulating light bouncing off the water and the other will act as a special effect, volumetric light streaming through the unseen canopy of trees above. At this time select the parallel light or lights on the environment pallet and hit delete to remove them from the scene.

First a bit about spotlights. They are added to the scene with the spotlight tool which is the 4th from the bottom on right side of the tool bar. They act just like the camera in the way they are positioned and the way they attach themselves to object you drag over, see tip above. Additional controls are the two red circles that control the areas of intensity and the 2 red nodes that control the fall off from the source. See Figures 48 and 49. Here you

see a top view and a front view of the fill light, you don't need to match this placement exactly but something like this is recommended.

What we have here is a very soft spotlight, the idea is it's filtered from the trees above. The fall off nodes are below the surface of the water as we want full intensity of the light across our scene. Double clicking on a spotlight will bring up a spotlight view window very similar to the camera view window. This window can also be used to position the spotlight. With the spotlight selected bring up the Object properties pallet for complete control of the light (Figure 50). Here you can name the light, add gels and effects, and set all its parameters. If you click where it says Light source radius you'll see the Full intensity distance and Total falloff distance reflect the positions of the two red nodes you dragged out. The angle and edge softness reflect the size of the two red circles. You can also control the way the light falls off, either exponential or lin-



Figure 47

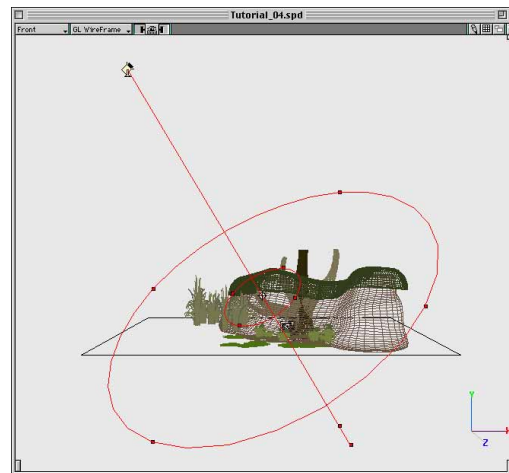


Figure 48

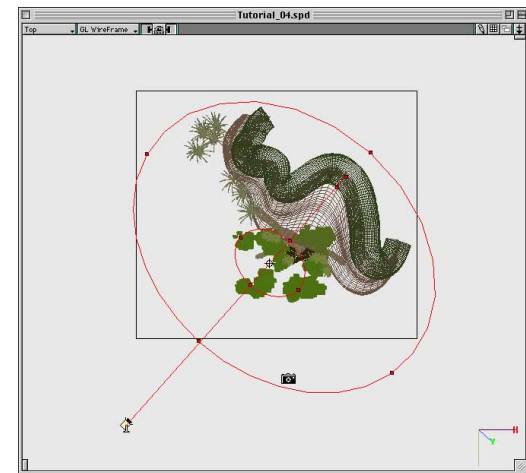


Figure 49

ear. For now, exponential is fine. Make sure the check box for shadows is checked and click the color button to set the color to a pale yellow, very little saturation. Another mistake often made is not giving just a bit of color to natural lights. There is really no such thing as a white light. They're either cool or warm. A bit of color will add a great deal of life to your scenes. That about does it for the fill light.

Now we'll add the bounce light. Bounce light is very area specific. If we wanted to add bounce to the entire scene we would have to insert a great many lights to cover the entire length of the bank, so for now we will just focus on the area around the tree.

Tip

As your scenes get more complex and you are at a stage where you're adding lights and cameras you might want to hide some of the objects in the scene. On the project window you'll notice an eyeball next to each object. Simply click on that eye to turn that object off to simplify your scene assembly.

For bounce we need to pay close attention to the falloff of the light as we don't want the bounced light to reach very high, that would look unnatural. For this process I've turned off all my grass and reeds by clicking on the eyes next to their groups in the project window. Insert another spotlight and position it like this. (Figures 51 and 52). I've also switched my view to orthographic to get a better view. The idea here is the light is just below the surface of the water and just in front of the tree. The light points at the tree and the fall off begins at the water's surface and ends about half way up. The light is set to

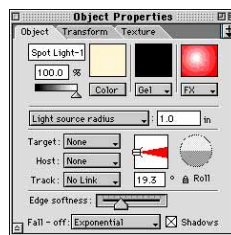


Figure 50

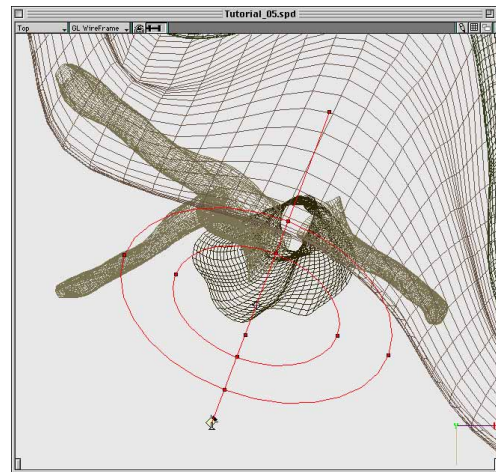


Figure 51

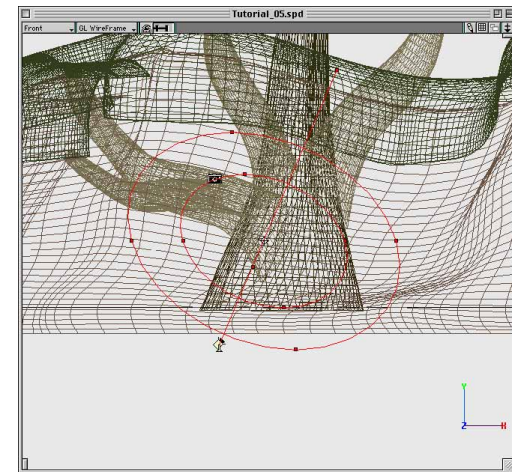


Figure 52

a dark green color and the intensity is set to about 90%. Also, it's important to turn off shadows for this light or else the water plane will cast a shadow and you'll see nothing. This is all very flexible depending on the scene you develop. This type of light placement requires a lot of test renders and the snap shot feature of StudioPro makes this quite easy. Just drag out the area you wish to render with the render camera, last item on tool bar. I generally do test renders with the camera set to RT Good or Best and cancel or close the render window before it's complete. This is the best way to get a good feel for what the light is doing. Another tip is to use a bright color like red or purple until you have the settings the way you want and then switch to green. Your test render should

look something like this (Figure 53). Feel free to add more such lights. In a scene like this one I would add several around the tree to illuminate the bank and all sides of the tree. Just watch the intensity, it can get out of control quick.

The 3rd and final light we'll add is the volumetric light. It starts out as a copy of the fill light as it needs to be in the same general area. Click once on the fill light to select it and then hold down the option key and drag a copy. Position the light and adjust the falloff and edge softness approximately as I have here (Figures 54 and 55). Set the spotlight's intensity to 100% and reduce the amount of color saturation. Also, make sure shadows is not checked, we don't want double shadows. With the light positioned and set up properly the next step is to make the gel. From the resource pallet click on the Gel tab to bring it forward. Click on the new button and make a new image gel. Click on the map button and load from the textures folder, gel 6. Leave the tiling set to its default and that's it, you just created a custom image gel. Now, to assign that gel to the spotlight,



Figure 53

select the light and from the object properties pallet click where it says Gel and select Image Gel 1, this is the gel you just created. When a gel is selected, a black dot will appear to its left. If you like, more that one image gel can be applied to any given light. When you first assign the gel to the light the gel moves up in the list to between the two lines, that means it is loaded. If you choose not to use the gel simply select it again and the black dot next to it will disappear which means it is not being used. That gel is now set and if you like you can do some test renders to see how the light falls on your scene. It should render quickly as we've not yet added the volumetric. If you are pleased with the placement then move on to the next step, adding the volumetric.

First, you will need to create either a fog or a mist shader which you'll apply to the light; either will work fine. With mist you'll get a breakup to the visible light, just like real mist. You have complete control over the scale and detail of this breakup and it is fully animateable. With fog your options are a bit more limited as the visible light is a constant tone throughout, it does render a bit faster though. From

the texture tab on the resource pallet click on new and select fog. The fog dialog box appears (Figure 56). Click on color and set it to a pale yellow and click on link colors. Enable shadows will not need to be checked as this spot-light does not cast shadows. Enable shadows is used when you want objects to cast shadows through the volumetric light, a very dramatic effect. Set the density to about 35, max depth to 30 and the start depth to .1. Leave the falloff set to linear. These settings should provide an effective volumetric light. Now to assign the fog shader to the light. Bring up the lights properties pallet to assign the fog just as you did the image gel. Fog and mist are set under the F/X list as are other special effects like lens flare, pixie dust, fire, smoke and others, but that's another tutorial. With the fog and image gel set to your spotlight you're ready to render. One last important thing to note when using volumetric lighting. The render samples the light a set number of times between the source and the reference point, the default is 32 and this is often not sufficient. I've noticed, at times, I've needed to take that number as high as 200. The higher you set this number the

longer the render will take, but the smoother the visible light will appear. This amount is changed under the "raytracing esoterica" window. To access it hold the shift key down while dragging or clicking a render, the render window will appear (Figure 57). This window controls all aspects of how the image is rendered; it is also where you tell the renderer that you are rendering an animation and what frames to render. Next, make sure the render is set to raytrace and click on the Expert button. The raytracing esoterica window opens (Figure 58). The value you want to change is Maxim visible light samples; if 32 yields poor results in your render try 64 or 128. Just work your way up until you reach an acceptable value for the effect you wish to achieve.

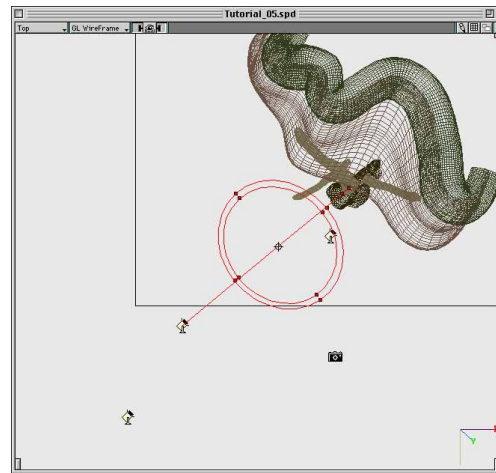


Figure 54

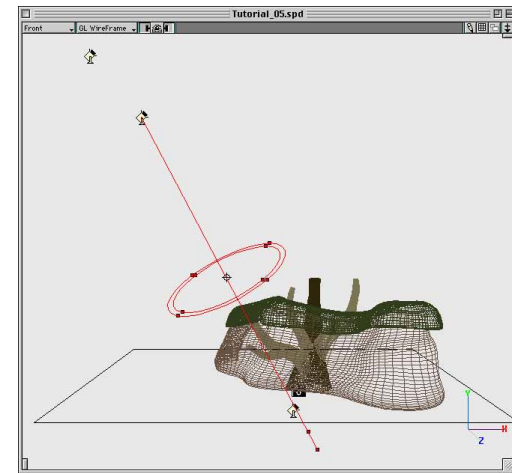


Figure 55

That's it. Your final render should look something like this, (Final render).

We covered a great deal of information in this tutorial, but we have actually just scratched the surface. Two very important aspects of creating digital plants are surfacing and modeling. If you have models that possess too few polygons and show faceting around the edges then realism is gone. Also, in regard to surfacing, try and stay away from flat colors, all plants have variations in their color and tone. If you want realism you have to mimic

that. Do your research and whenever possible use scans from

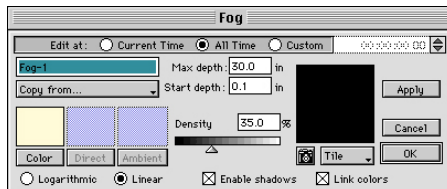


Figure 56

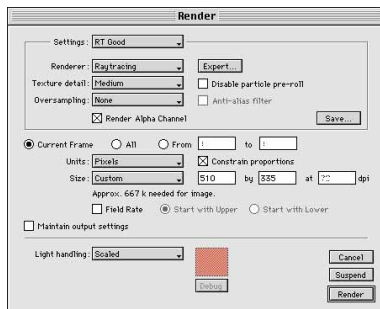


Figure 57

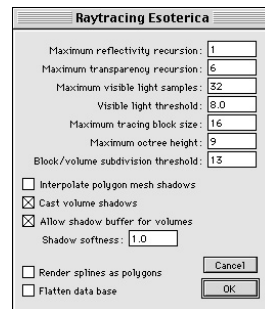


Figure 58

the real thing. Even if you don't have access to a scanner do go out and take photos for reference material, you'll be glad you did and before you know it you'll have volumes of photos that are invaluable. As for StudioPro, I've just barely touched on all the tools it has to offer. Personally, I use the application because I feel it has one of the best renderers you can buy and the surfacing control is hard to beat. Also, I've found that it is one of the most "comfortable" applications in which to work and that means a great deal when you are staring into your monitor for 10 hours straight. From this digital artist, it comes highly recommended.

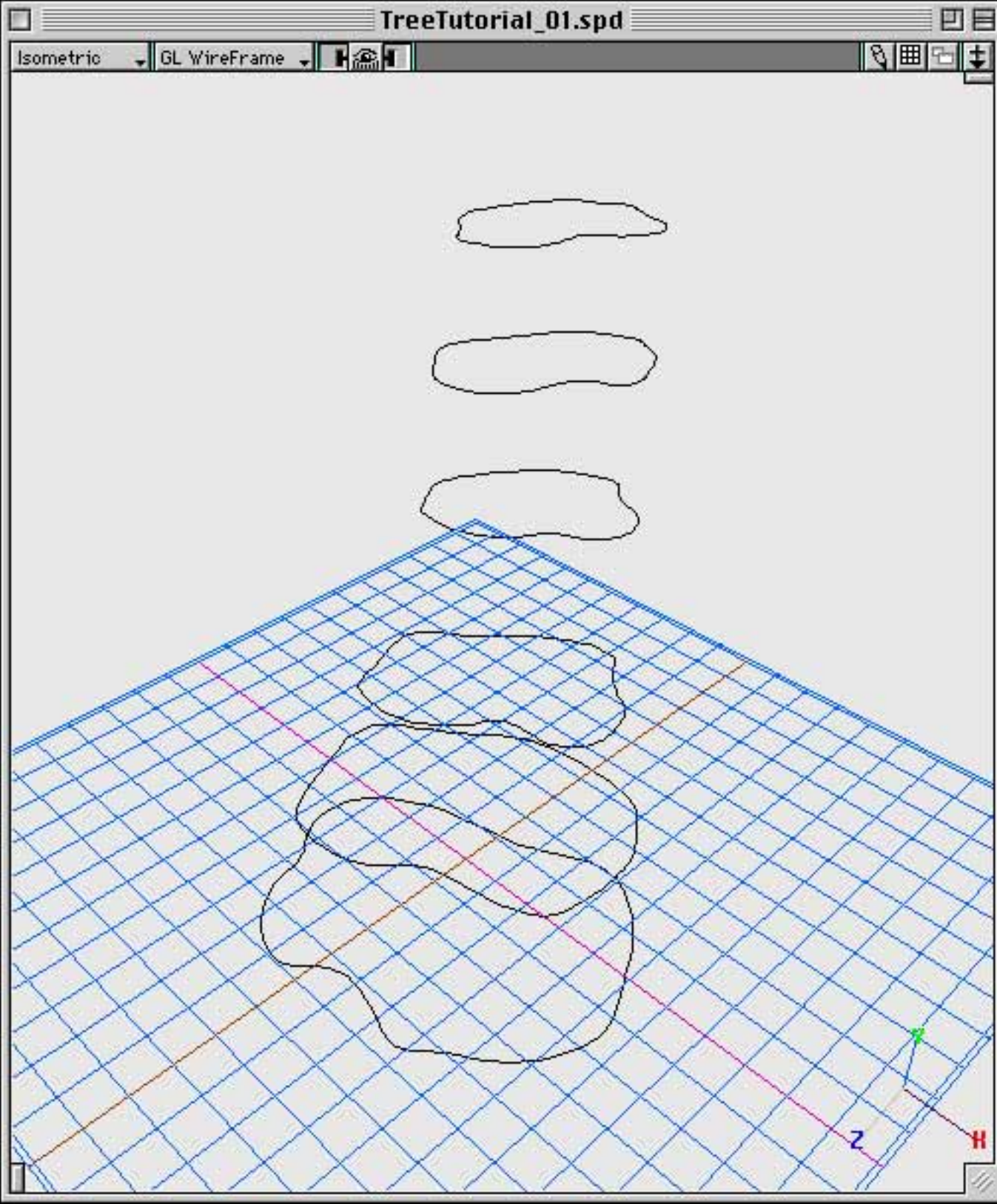


Final render



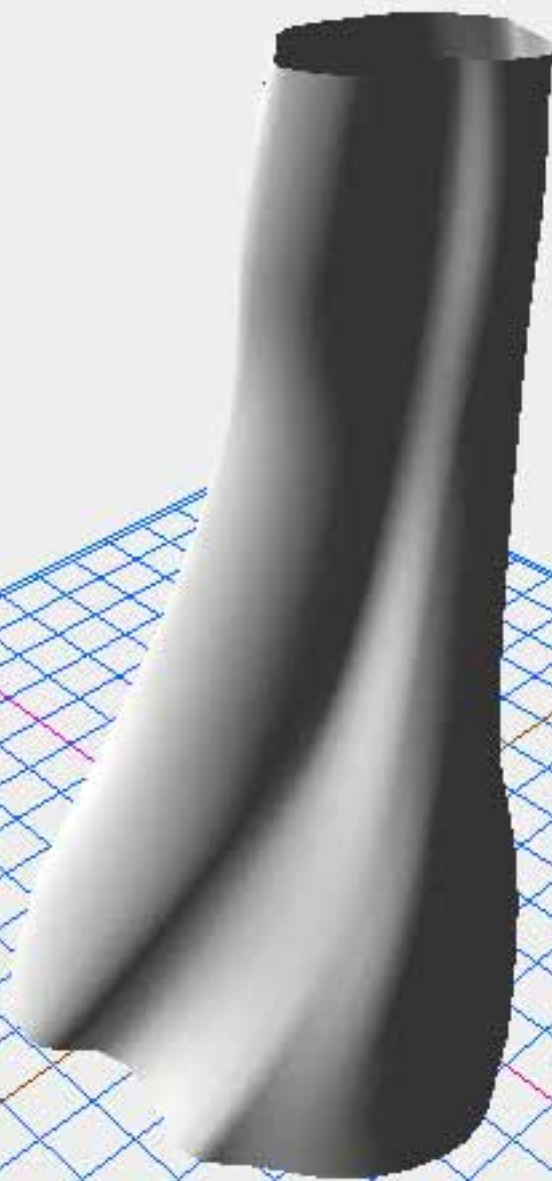
Isometric

GL WireFrame



Isometric

GL Shaded



Z

H

Isometric

GL Shaded

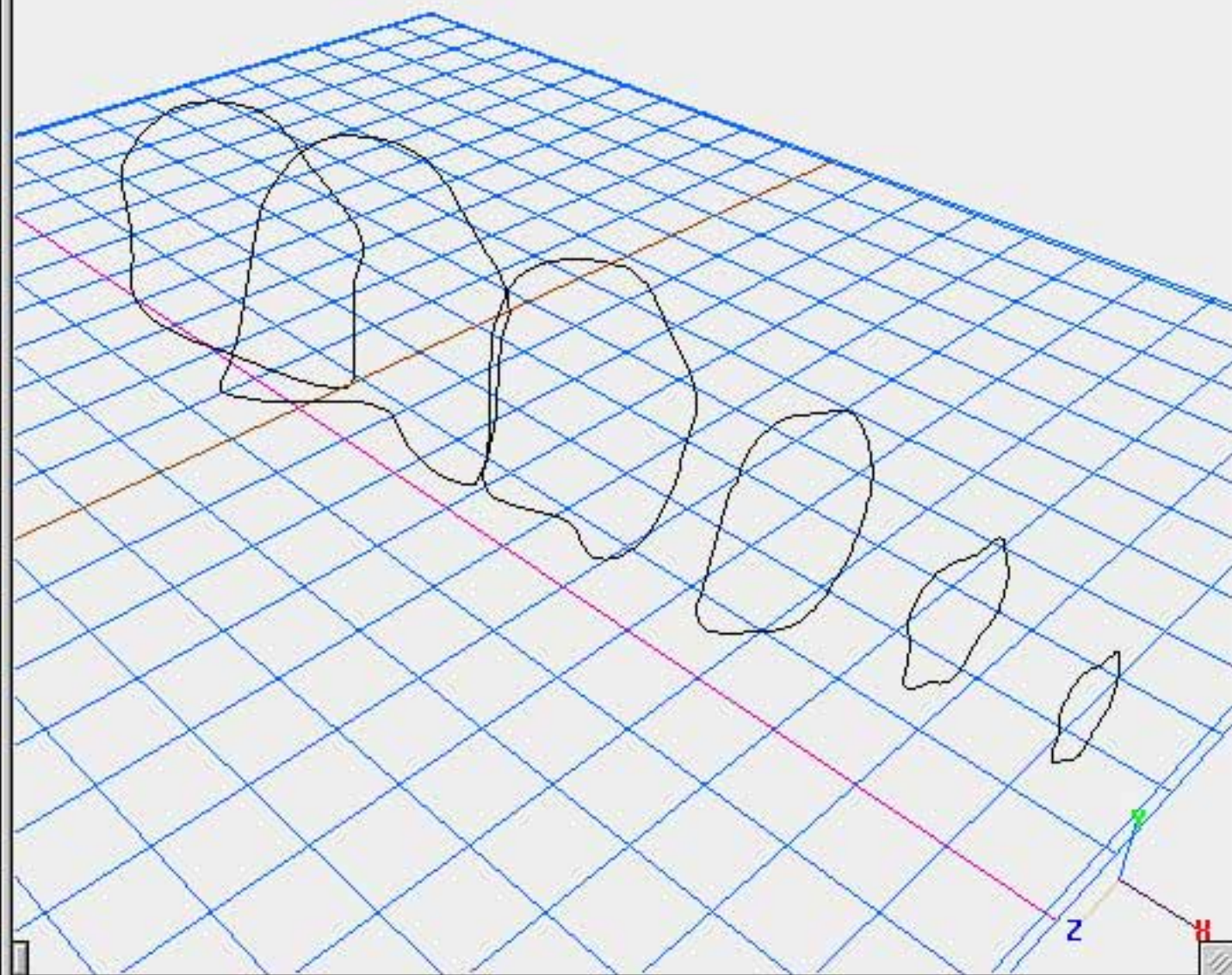
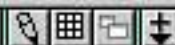


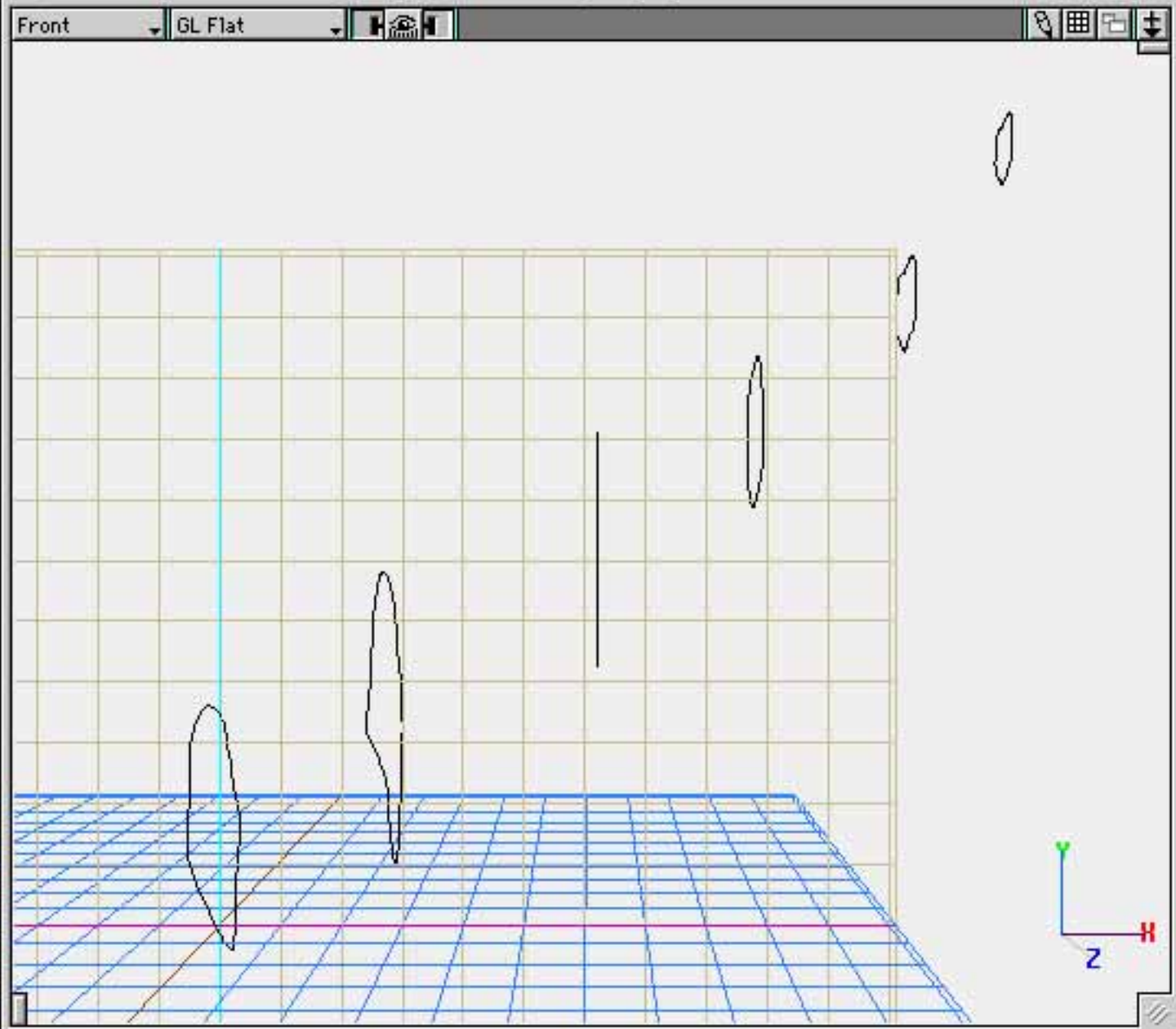
Z

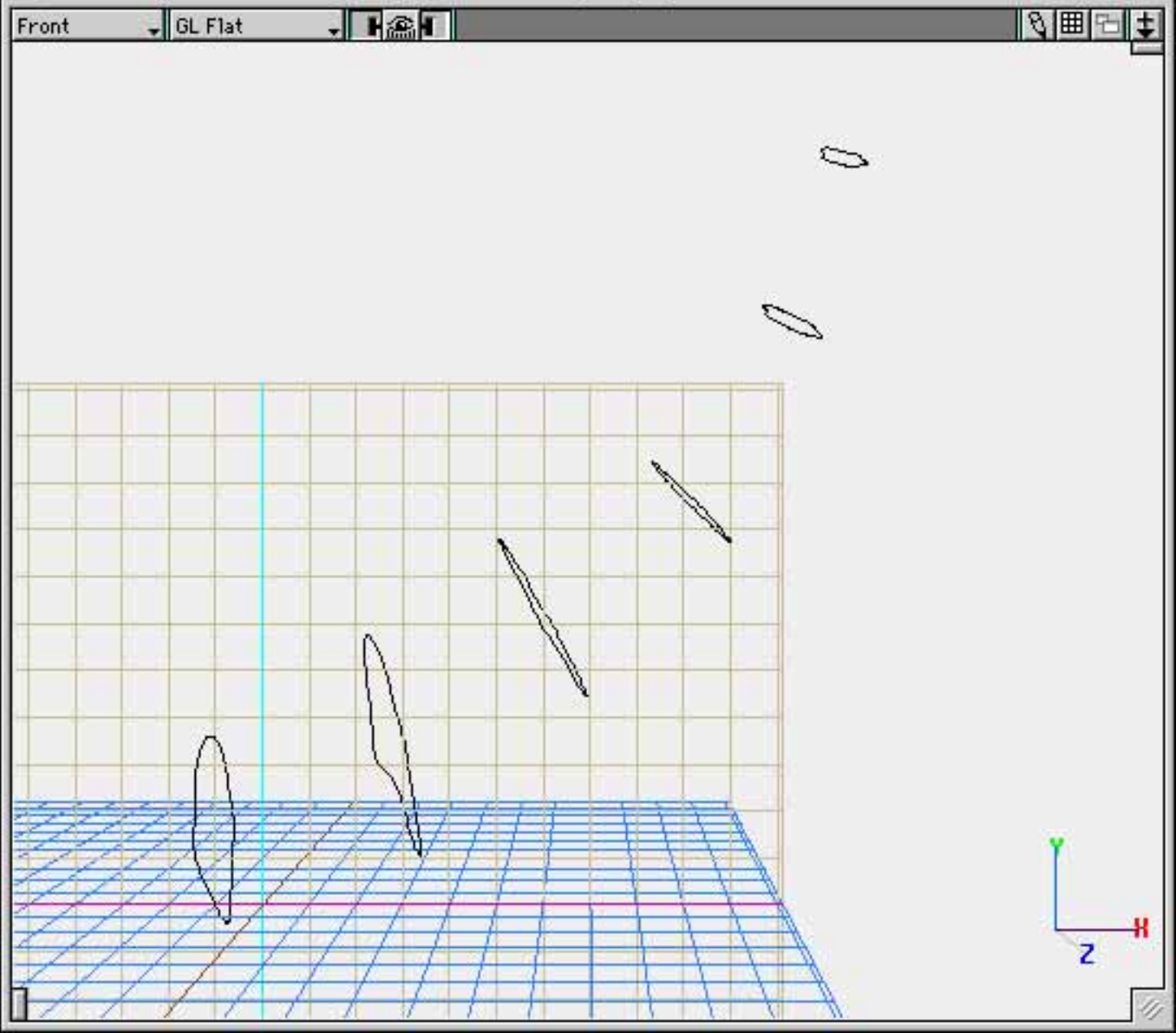
H

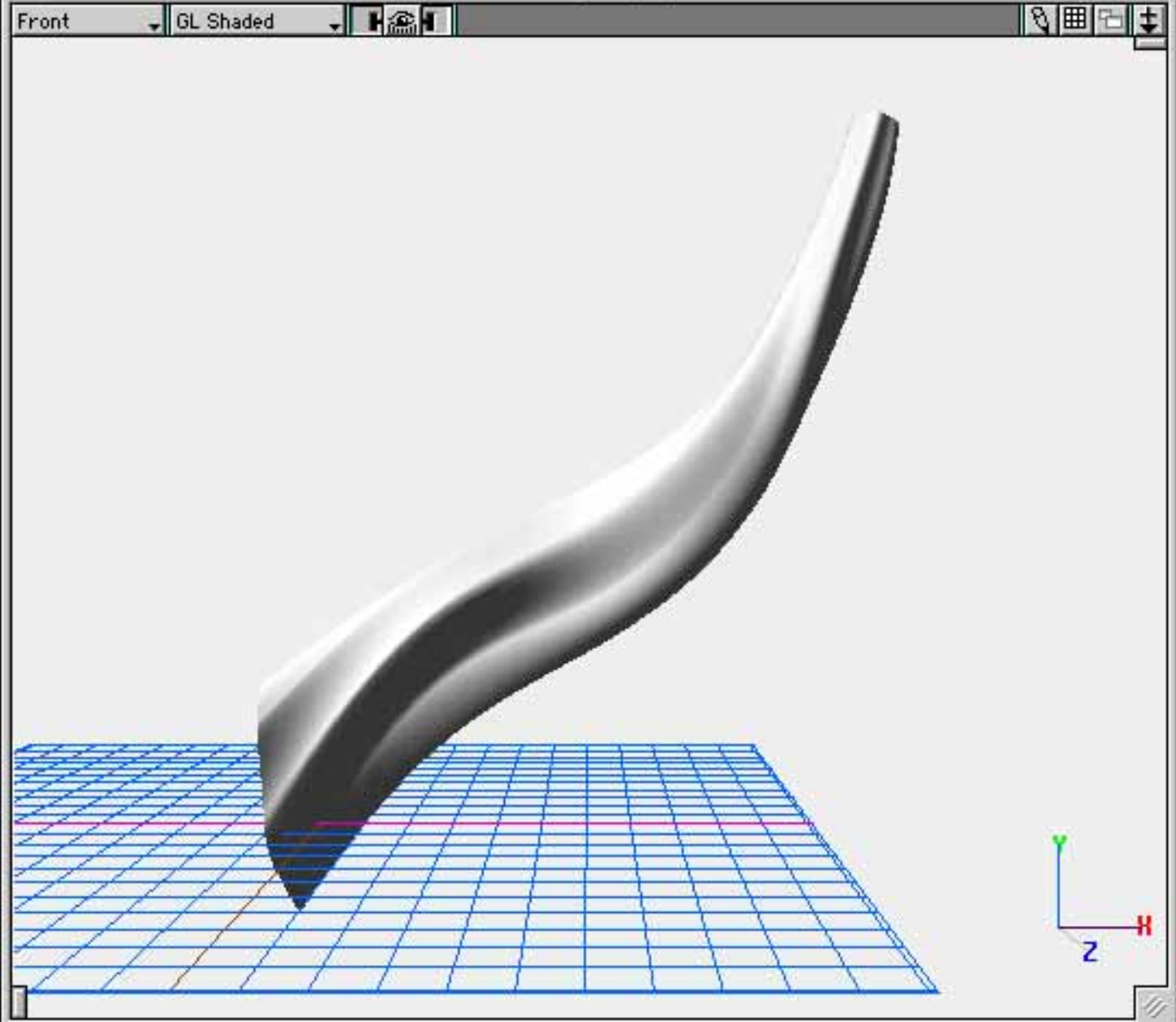
Isometric

GL Flat



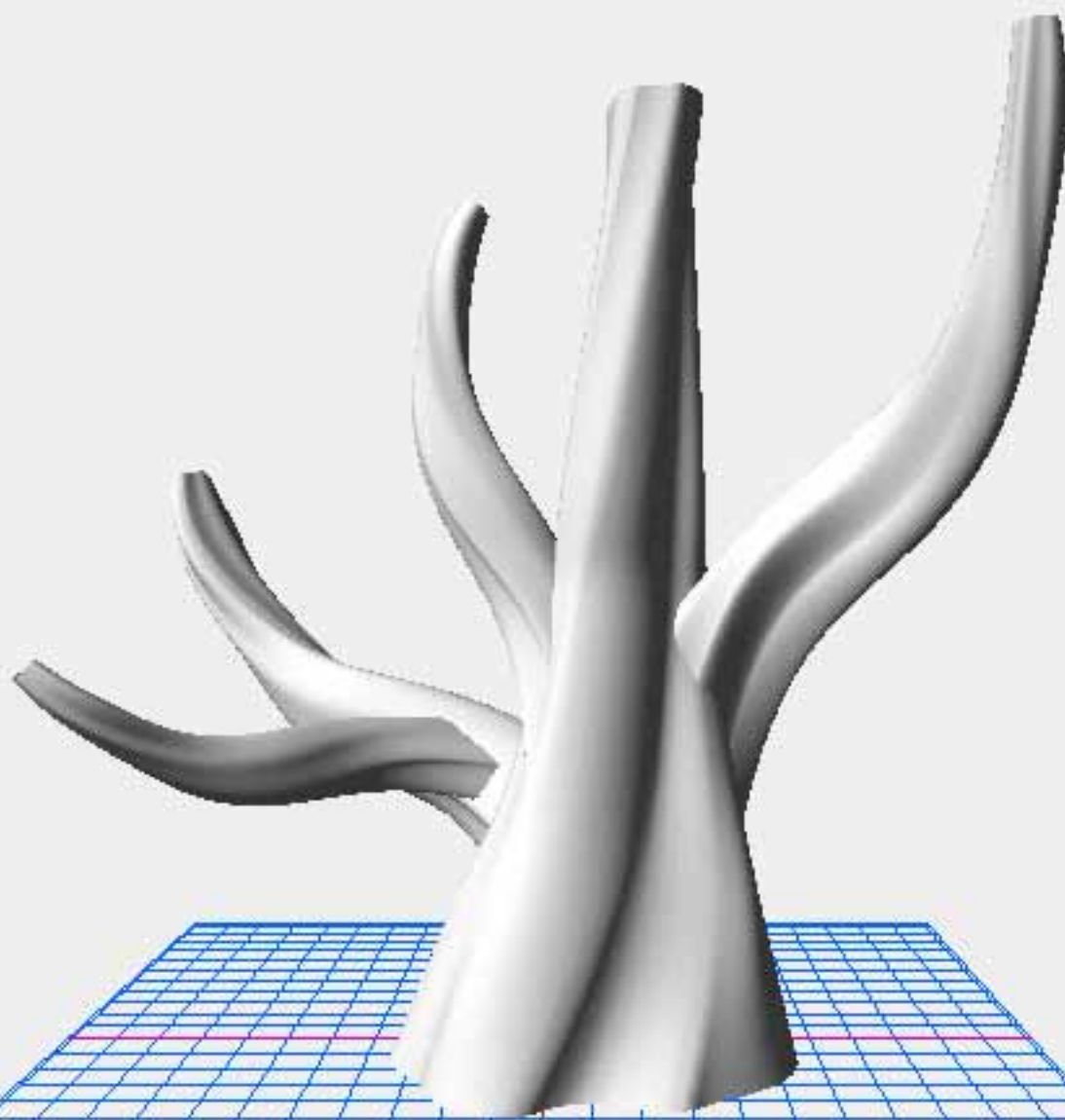






Front

GL Shaded

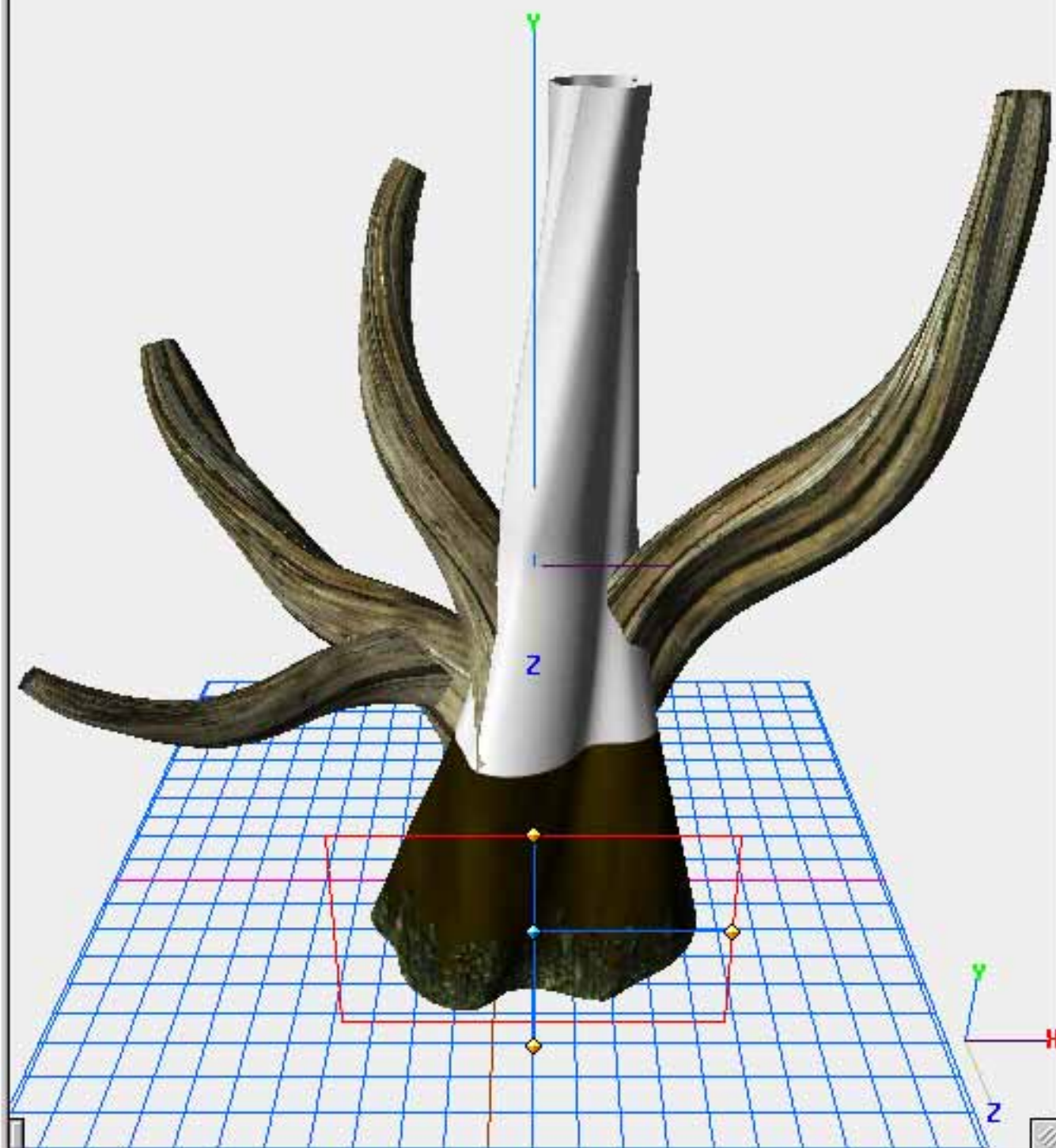






Custom

GL Shaded





Surface Texture

Edit at: ☐ Current time ☒ All time ☐ Custom 00:00:00.00

Surface Texture-1

Copy from...

Gloss 0.0 %



Clear 0.0 %



Apply

Cancel

OK



Tile

Color

Map



Diffuse Color



Diffuse

100.0 %



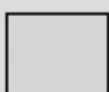
Ambient

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Glow

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Opacity

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Stencil

100.0 %



Presets:

Refraction

1.0

Plastic



Specular Color



Specular

0.0 %



Bump

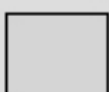
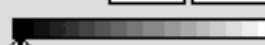
1.0



Reflect

0.0

0.0 %



Environment

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Caustics

Presets:

Micro-Polish

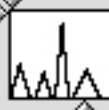
Plastic

100.0

1024.0

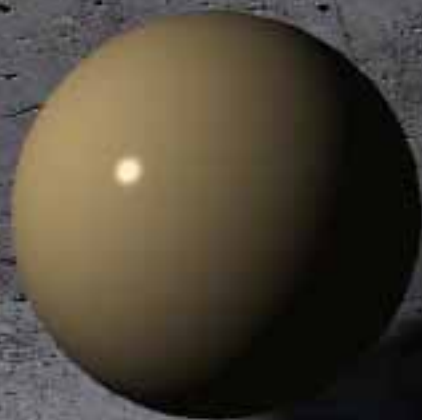
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0.0



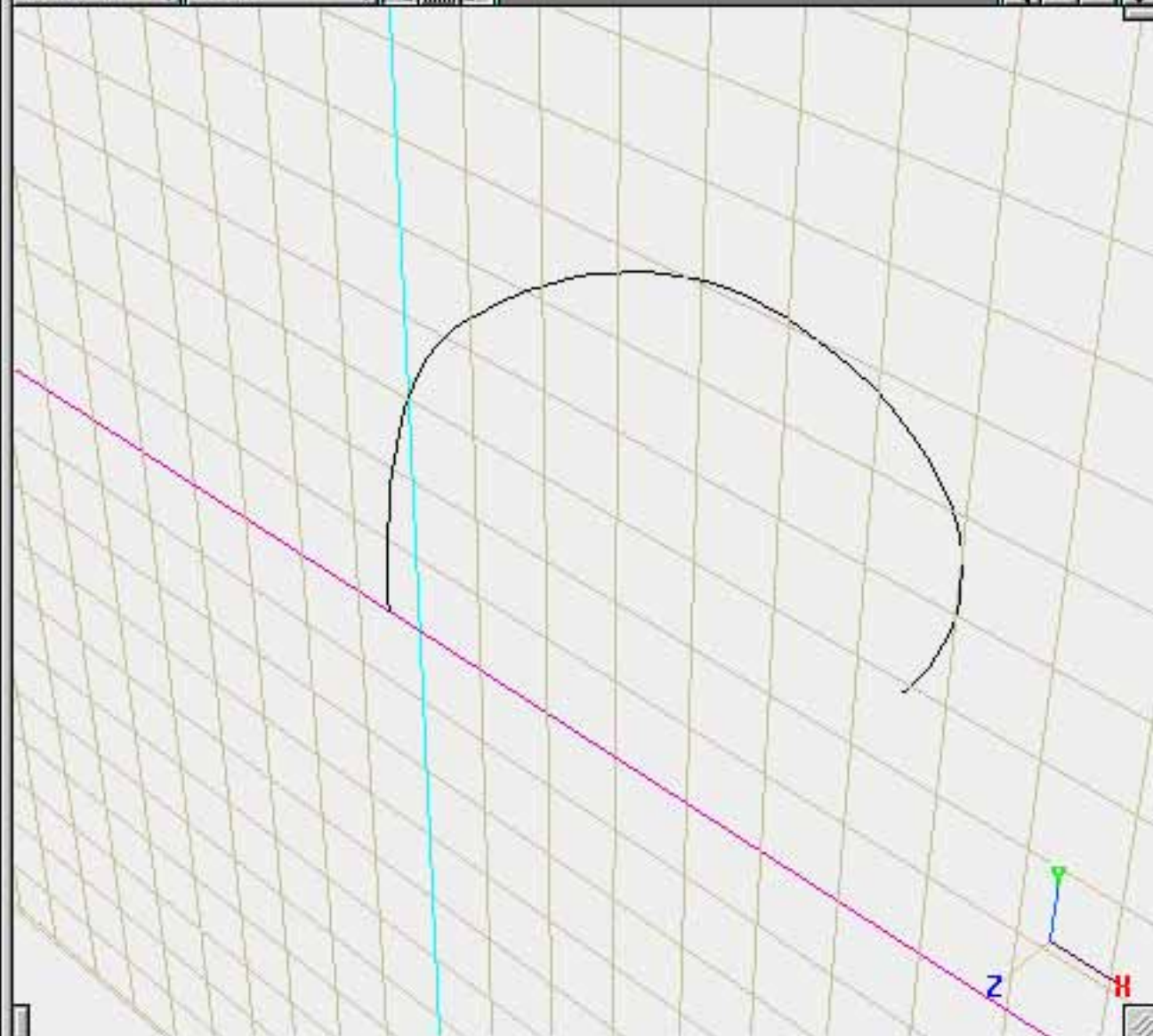
Expert

Compose maps



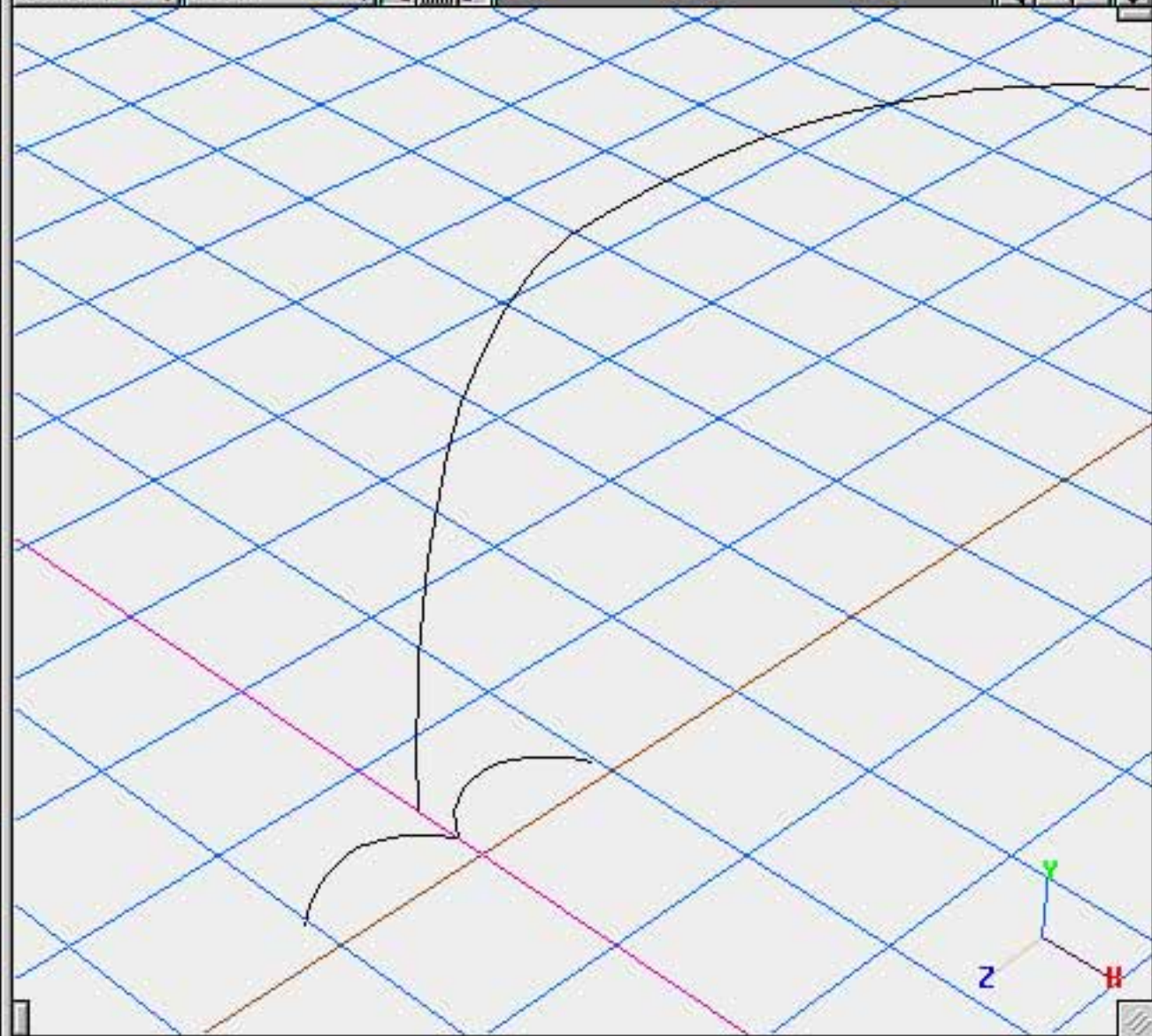
Isometric

GL Flat



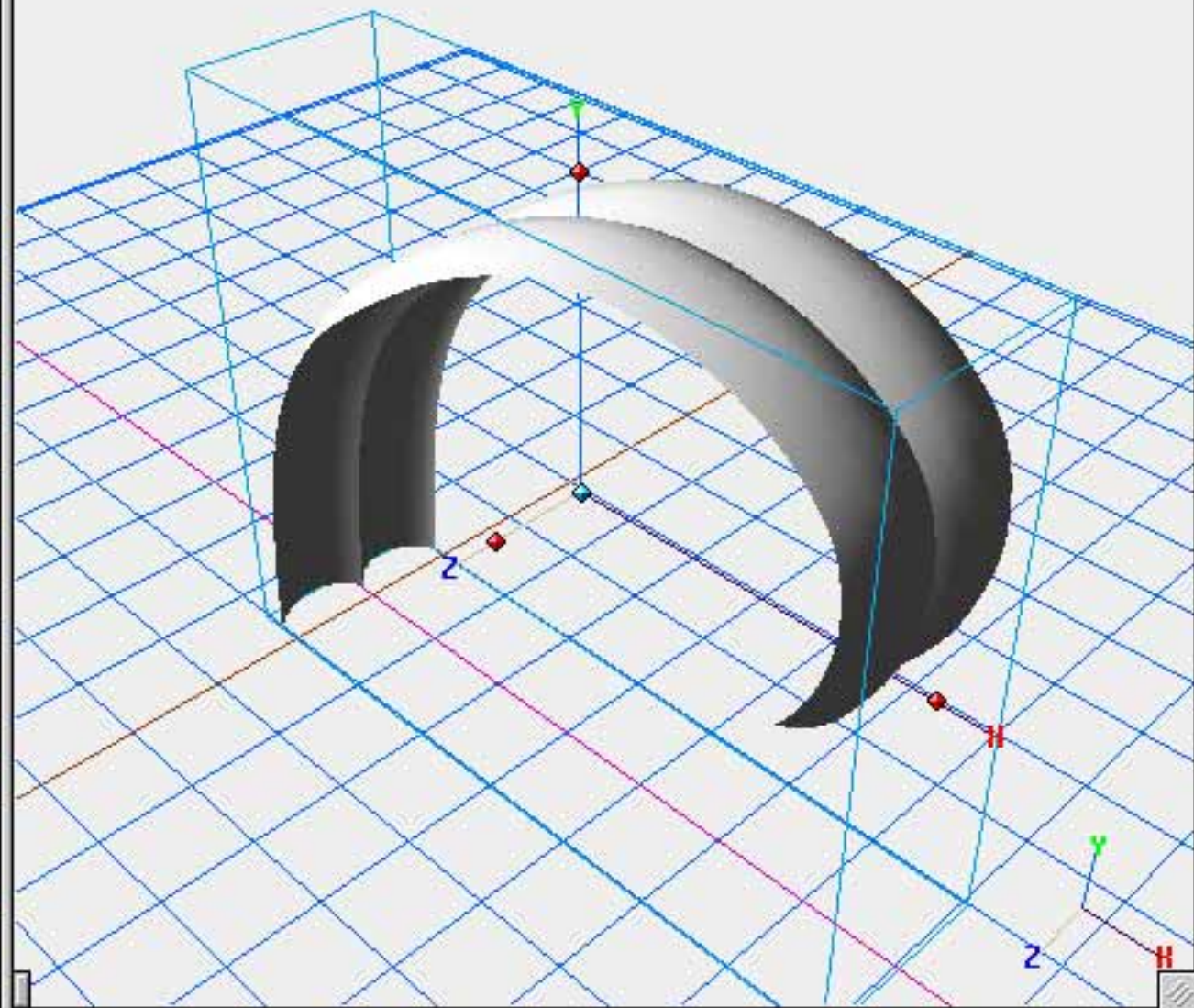
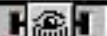
Isometric

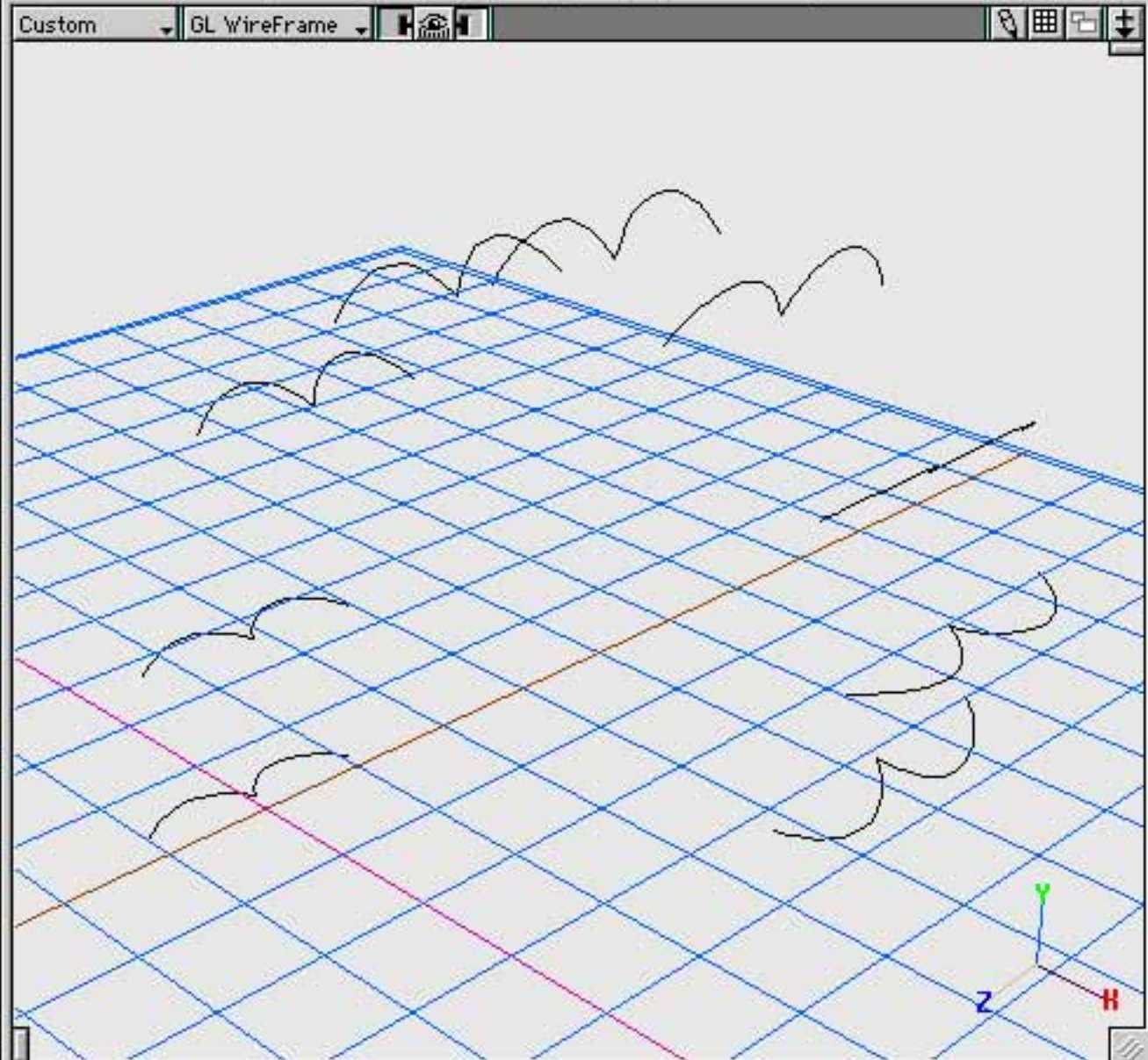
GL Flat



Isometric

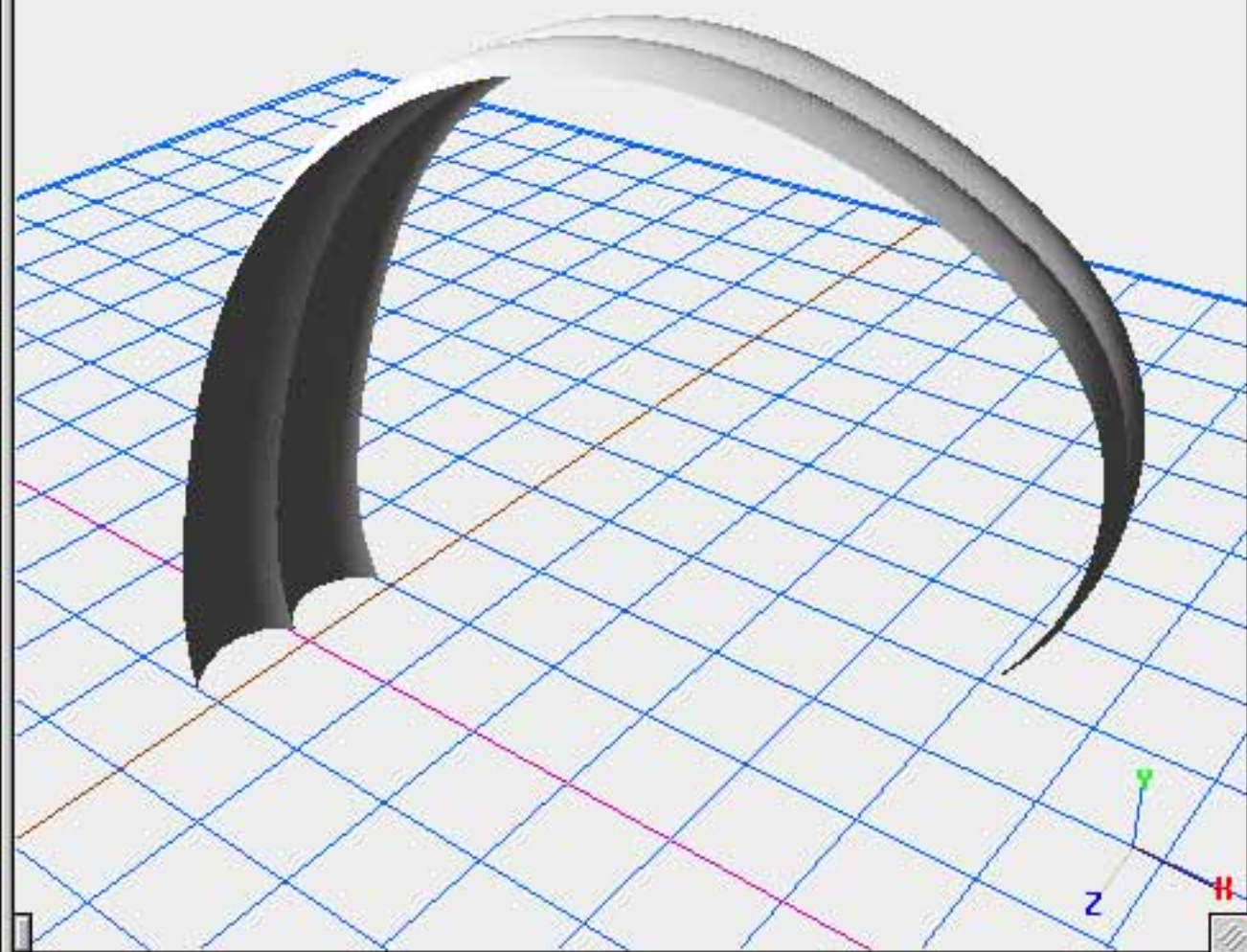
GL Shaded





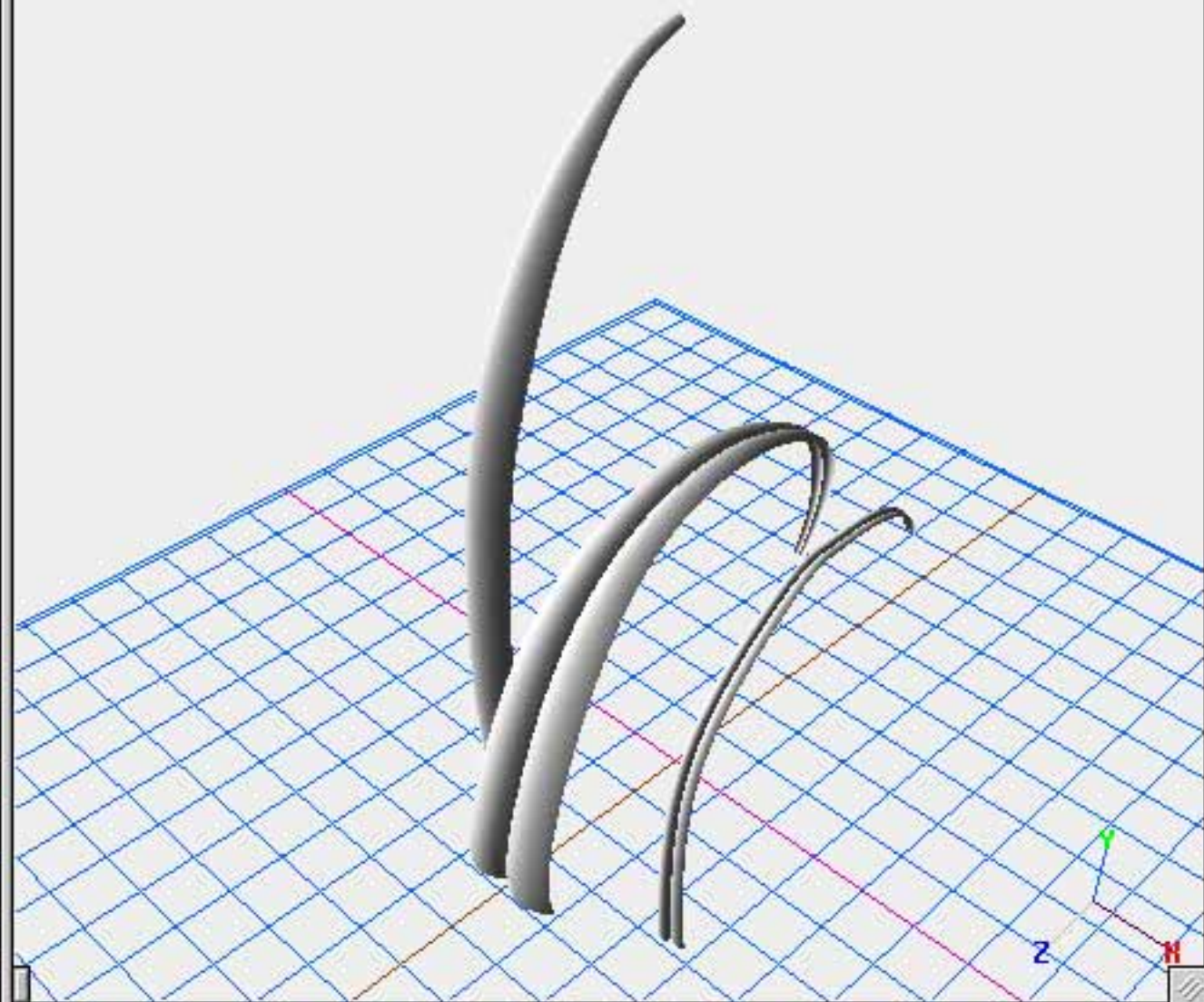
Custom

GL Shaded



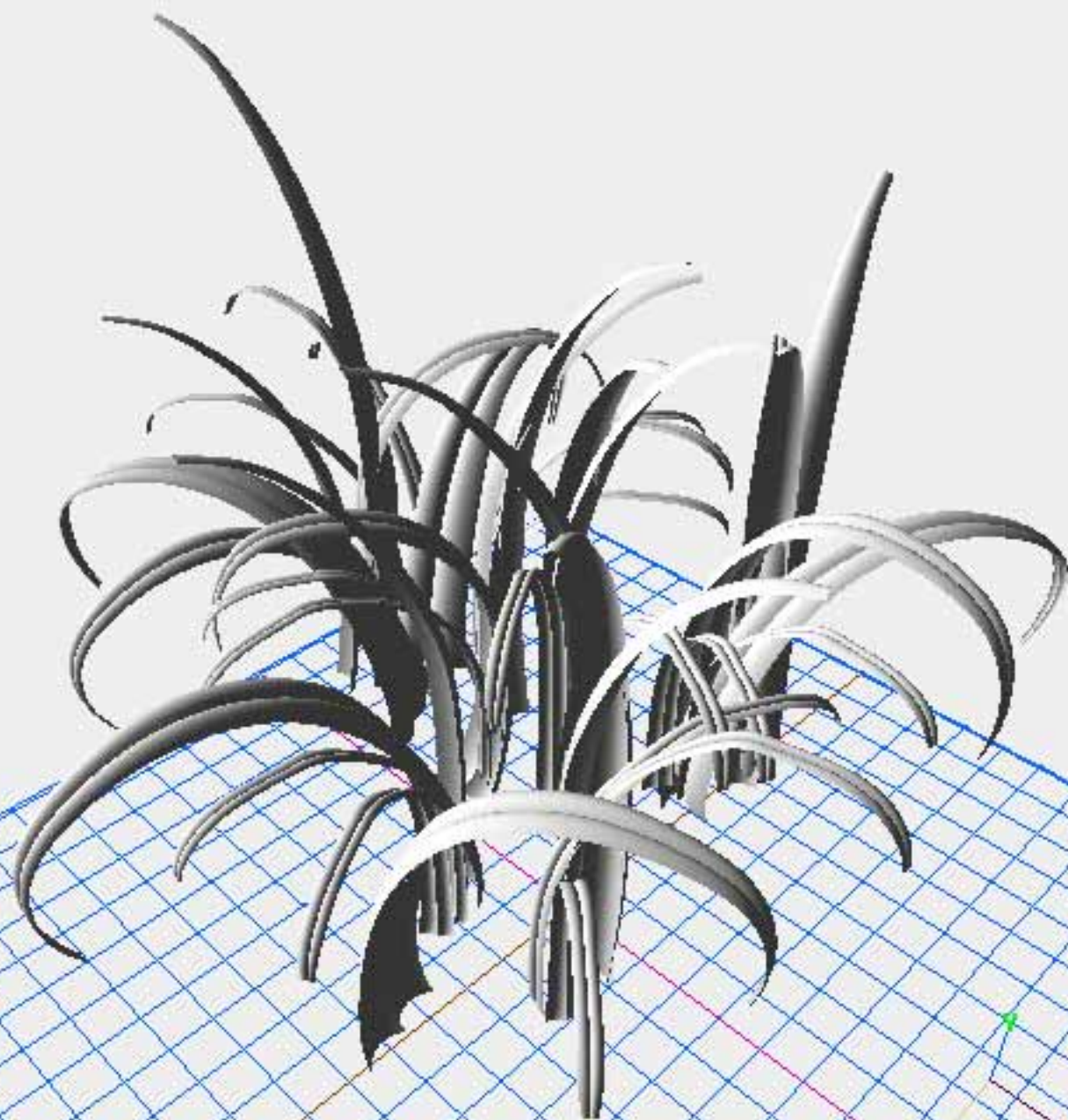
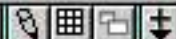
Isometric

GL Shaded



Isometric

GL Shaded



2

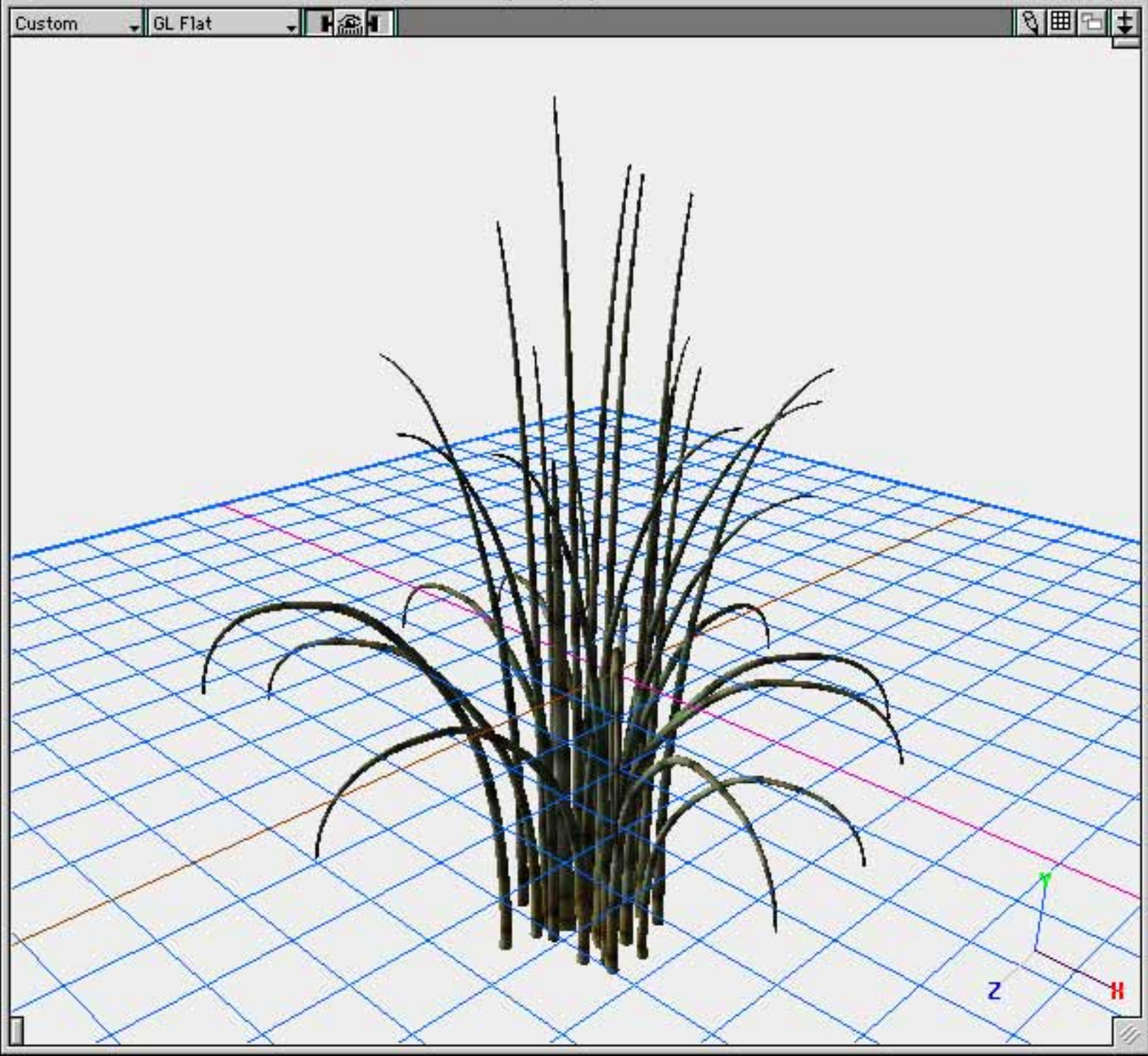
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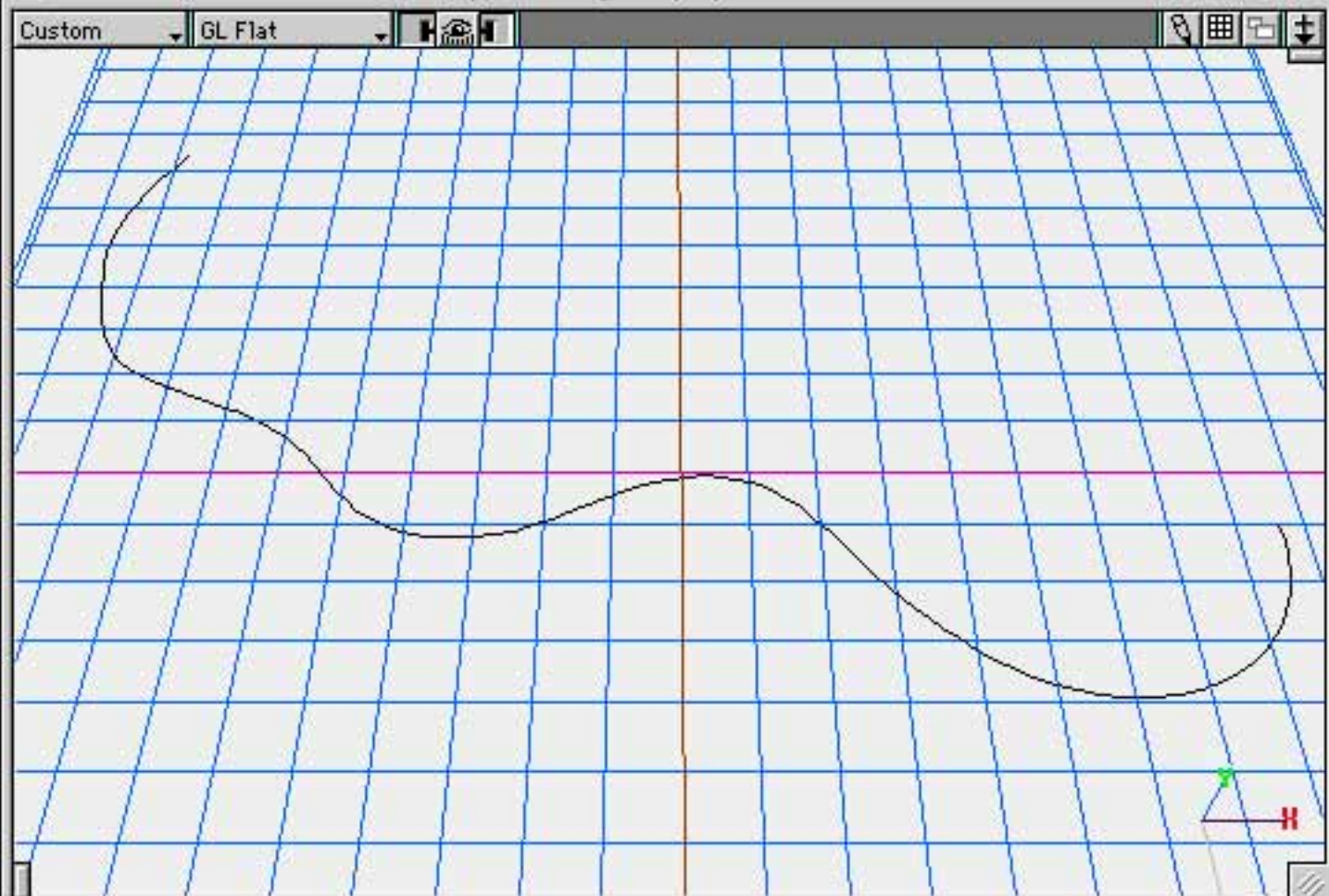
Custom

GL Shaded

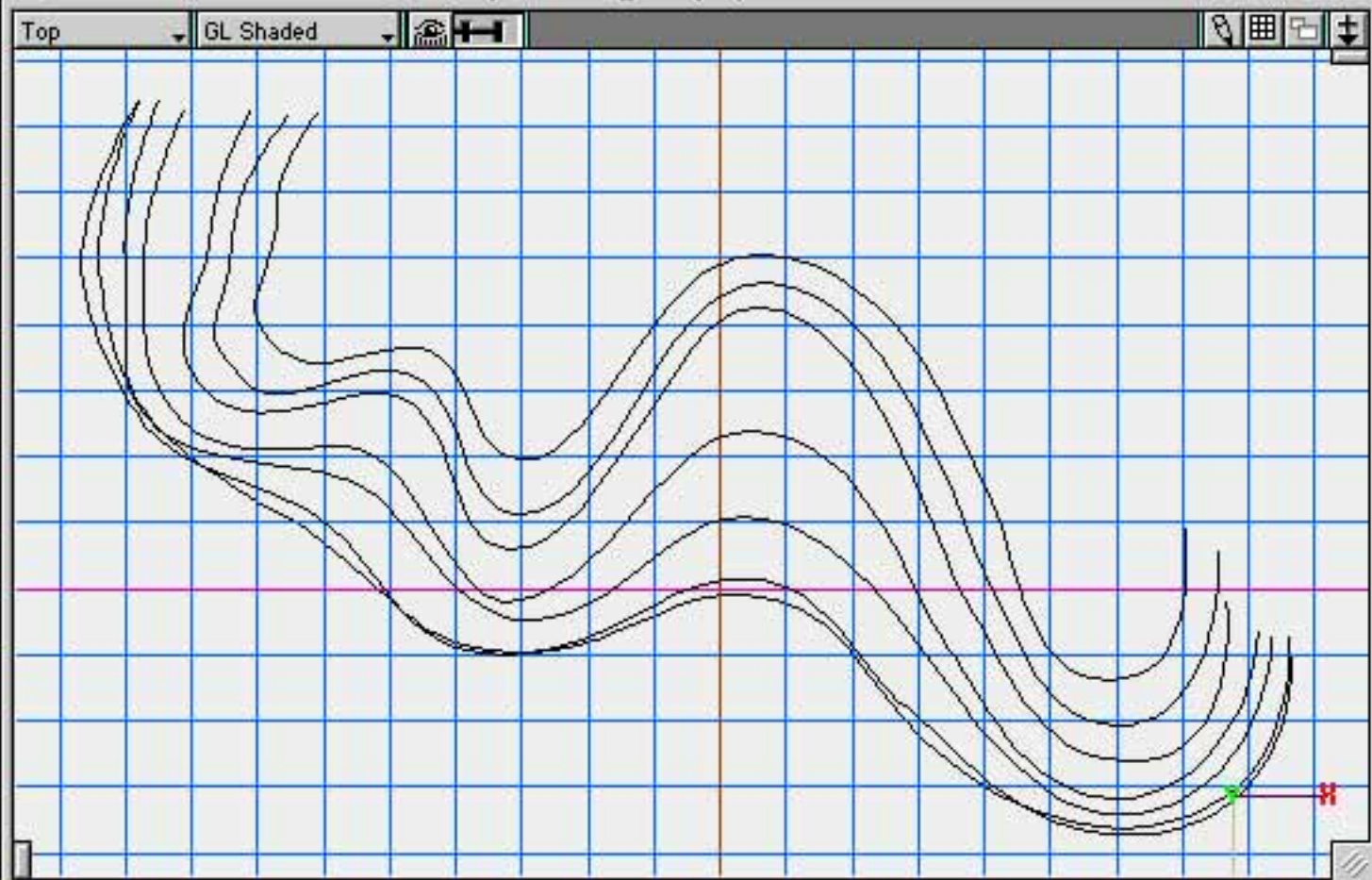




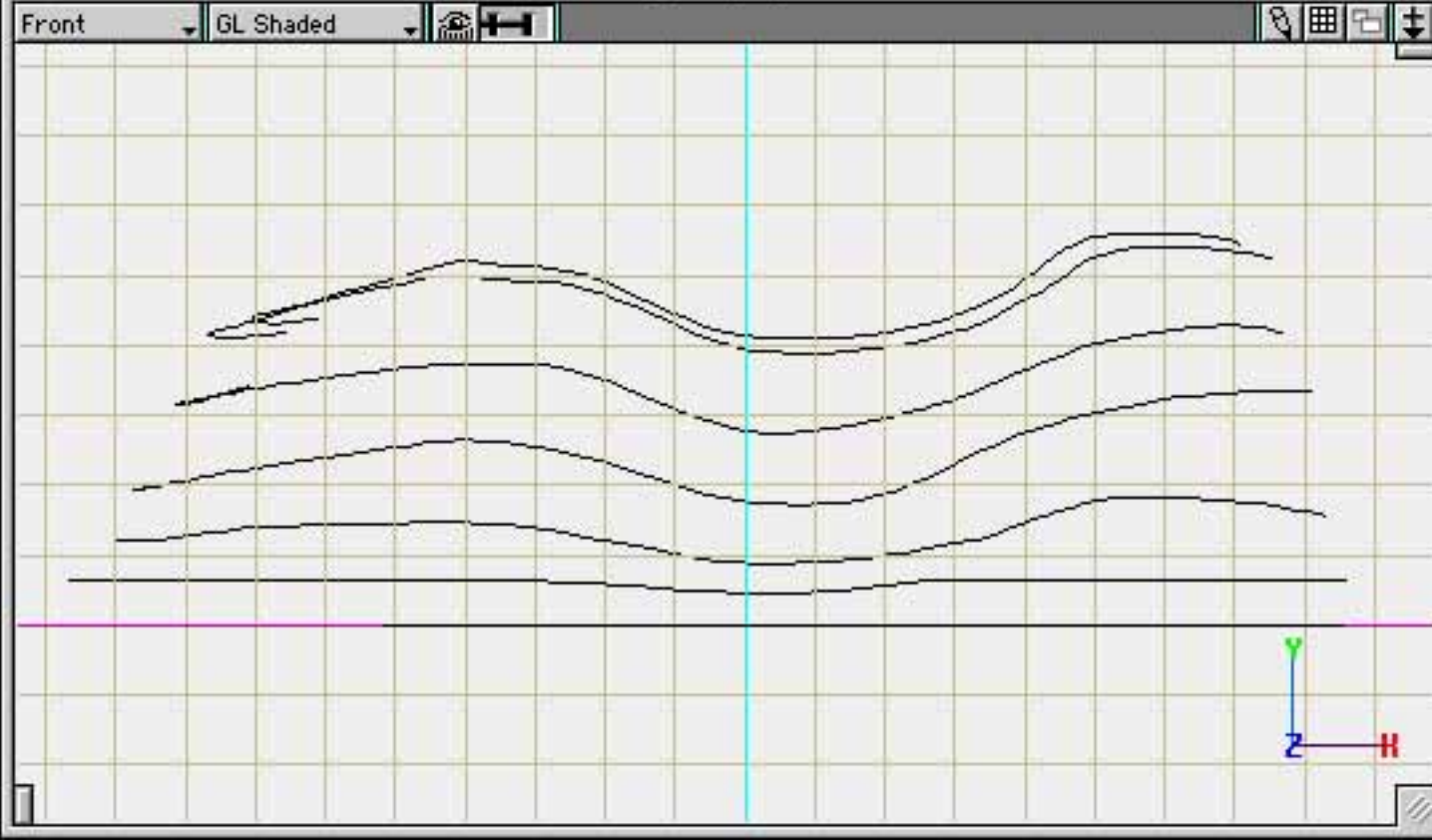
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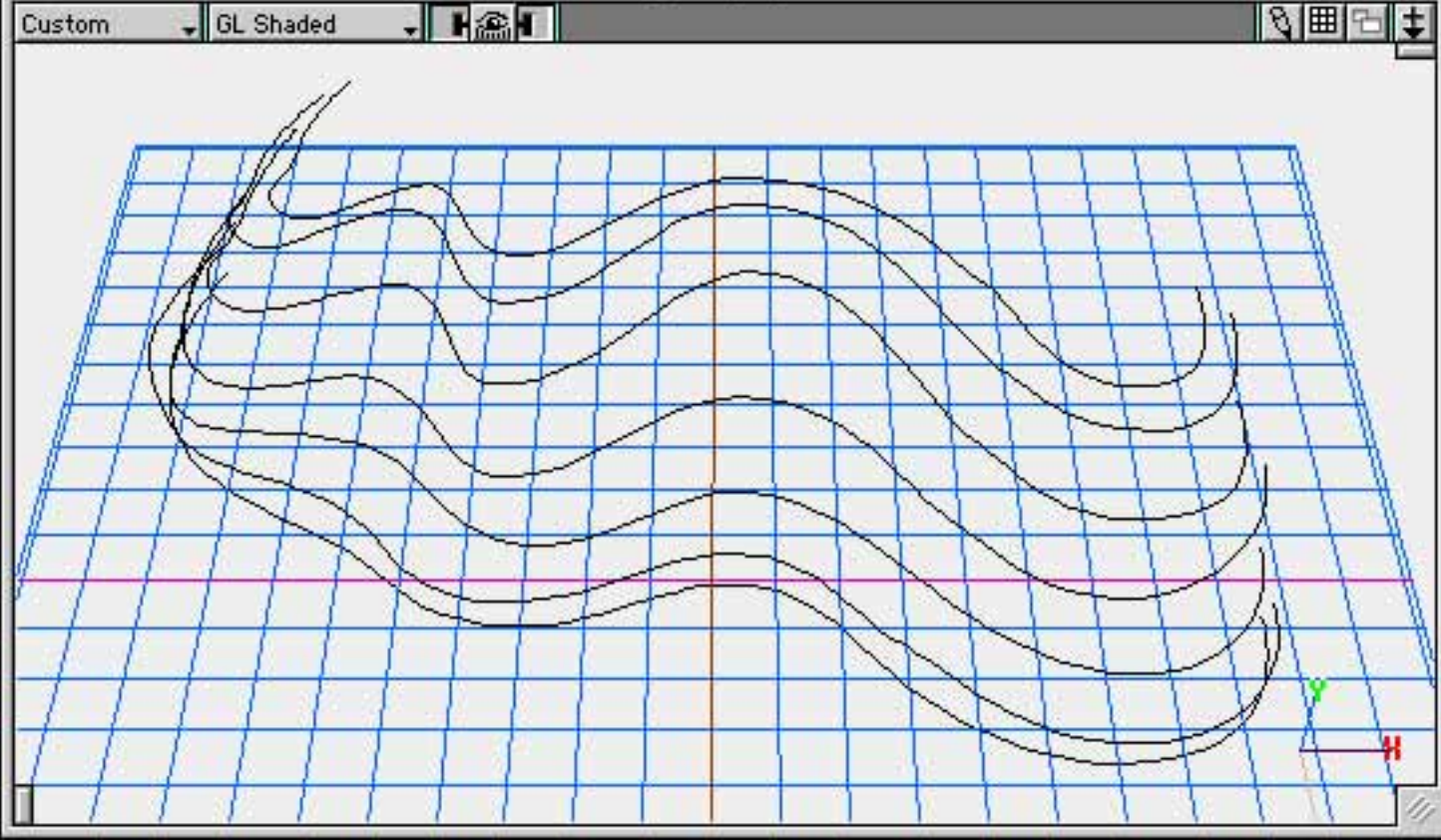


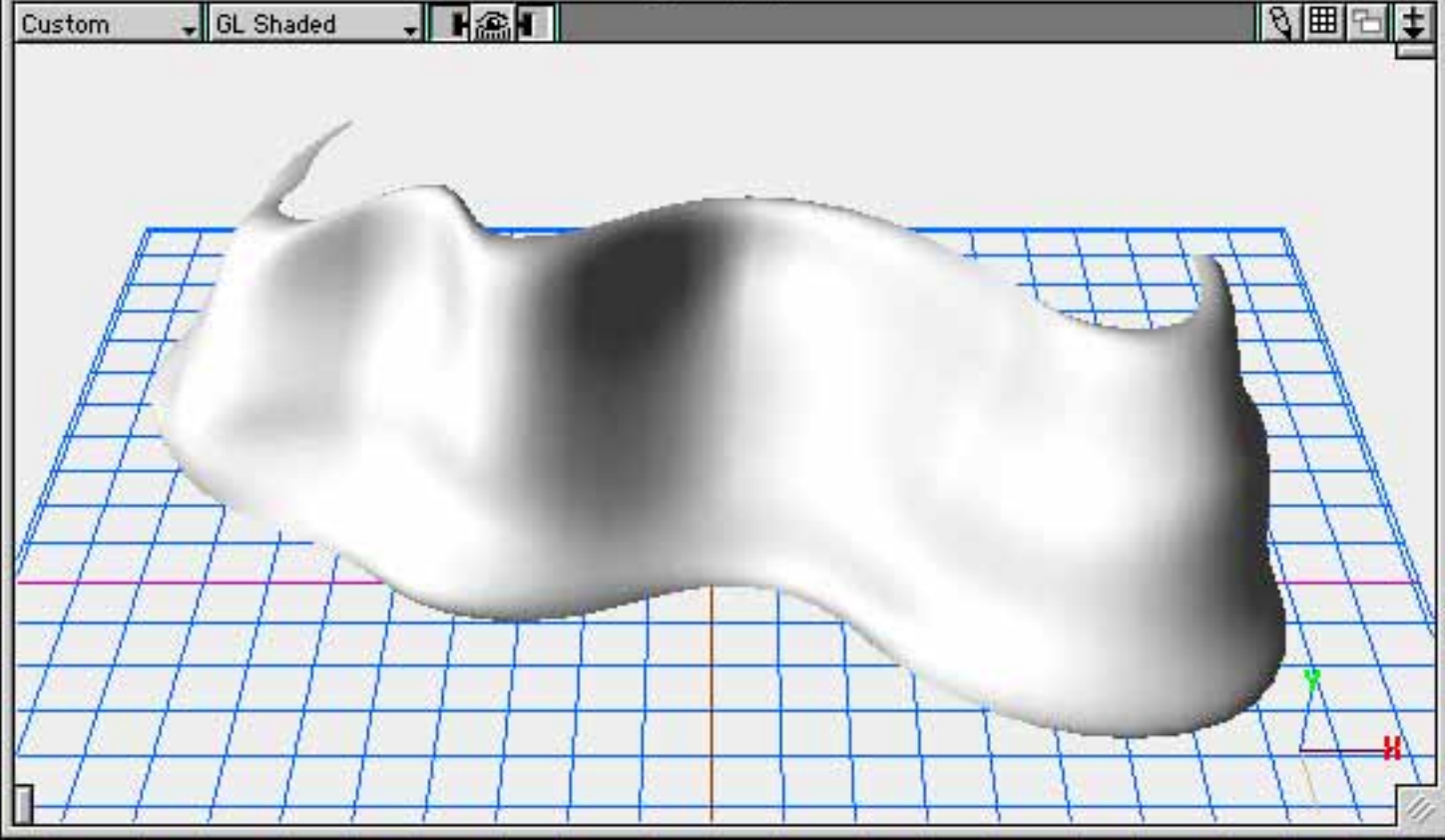
(Tutorial_03.spd) Small Hill

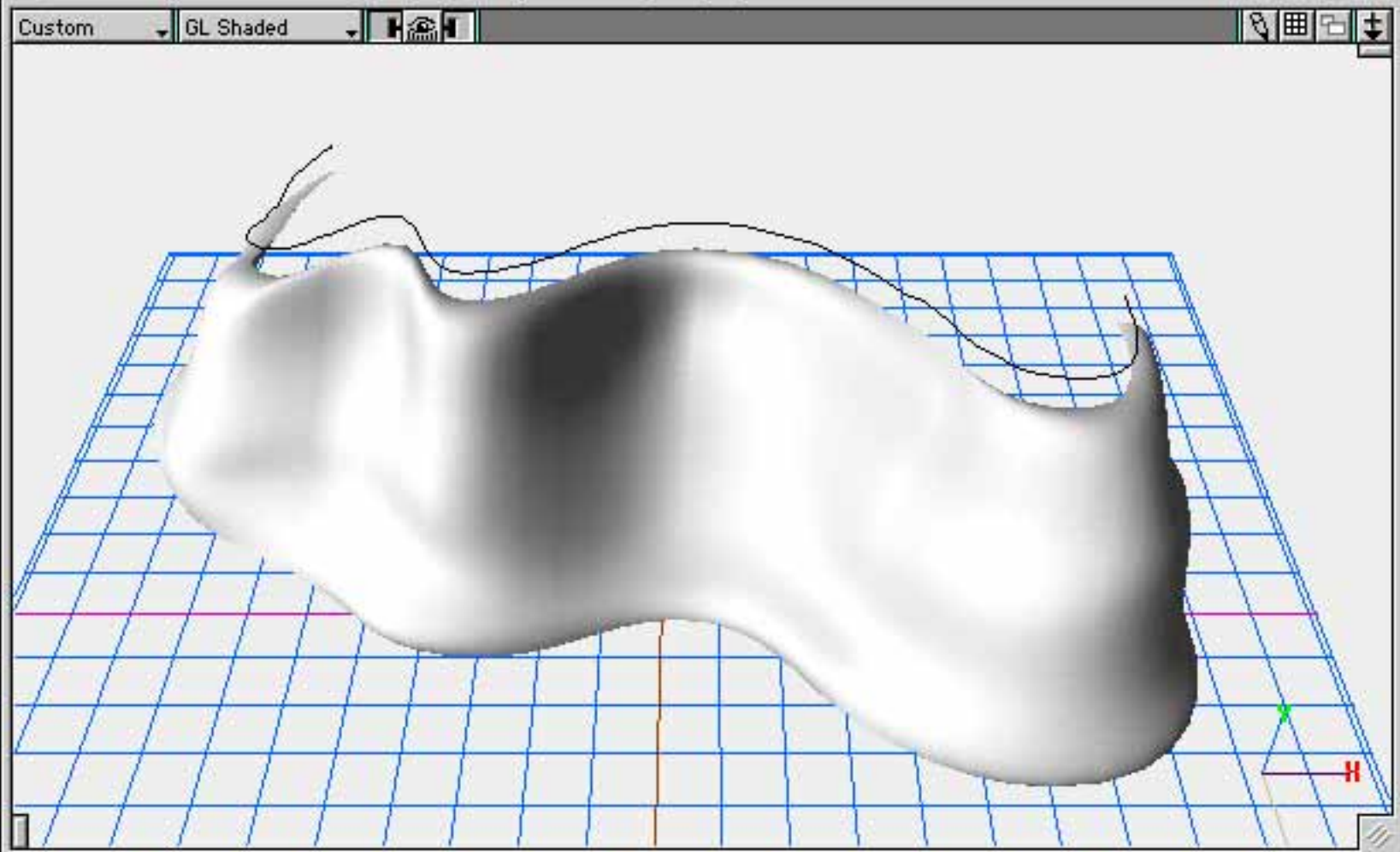


(Tutorial_03.spd) Small Hill

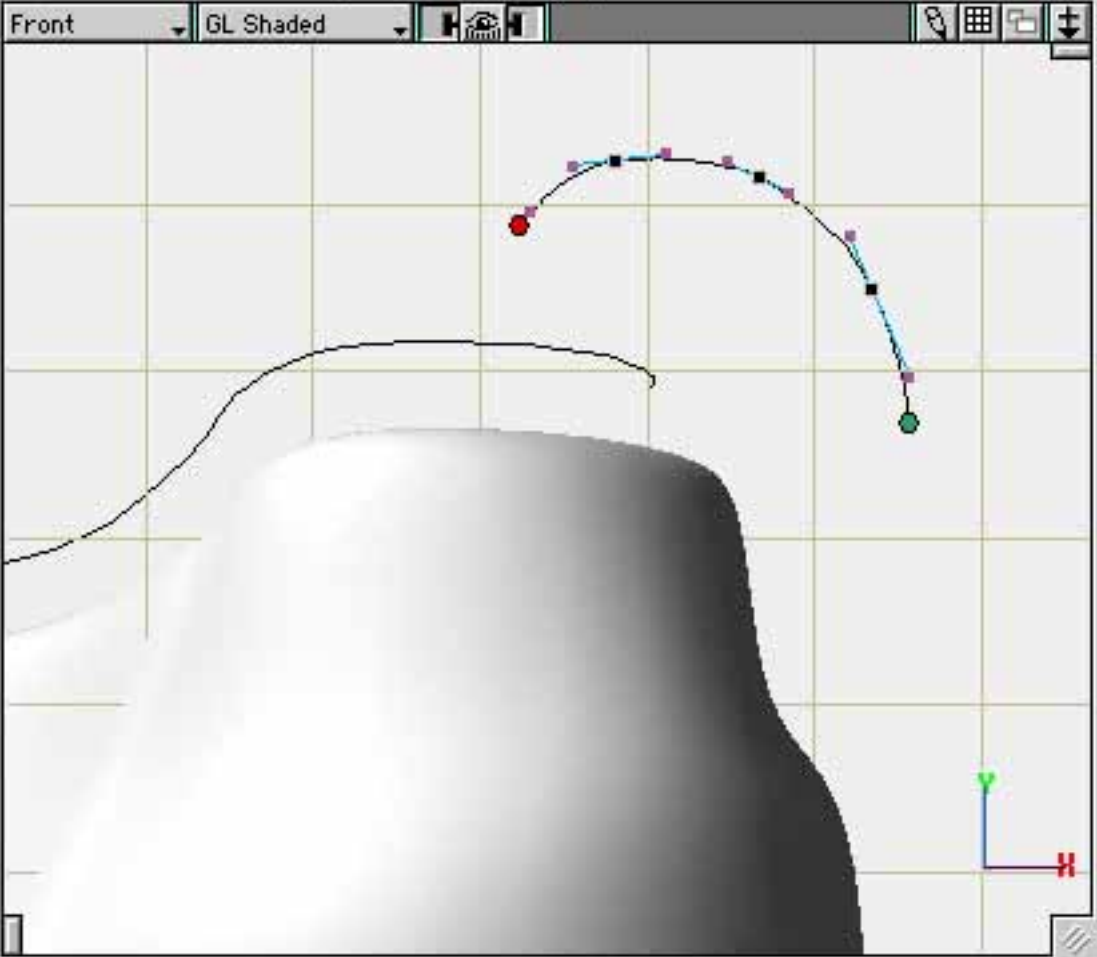




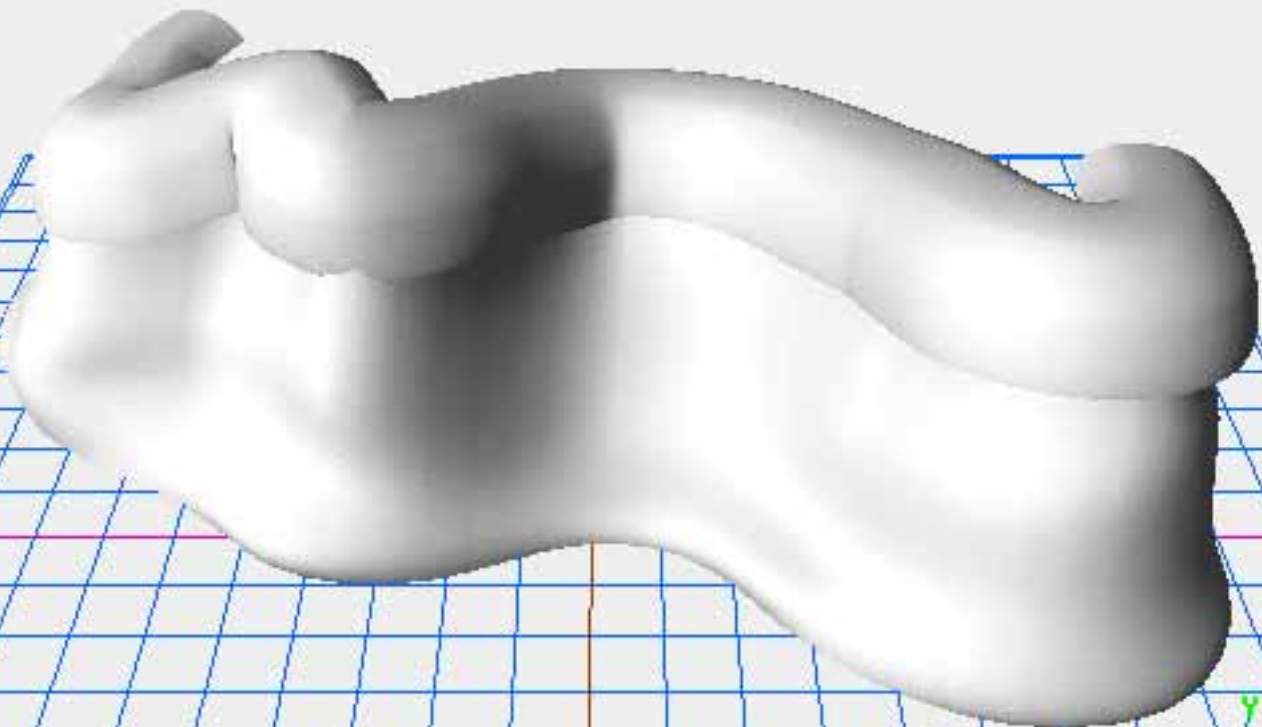
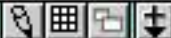




(Tutorial_03.spd) Small Hill



Custom GL Shaded







Custom

GL Shaded



Extend™ Ripples

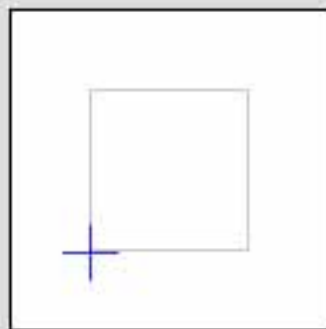
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Extend™ Ripples-1

Copy from...

Ripple Location:



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Ripple Type:

- ☒ Circular
☐ Linear
☐ Random

Direction:



Add Ripple

Delete

Selection: 1

Apply

Cancel

OK



Tile

Frequency 20.0 %



Speed 4.0



Viscosity 2.0 %



Cur1 0.0 %



Amplitude 10.0 %



Age 0.0 sec.



Peaks 0.0 %



One-linear 30.0 %



Overall:

Amplitude 0.0 %



☐ Caustics

Randomness 10.0



Extend™ Ripples

Edit at: ☐ Current Time ☒ All Time ☐ Custom

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Water Ripples

Copy from...

Add Ripple

Delete

Apply

Cancel

OK

Ripple Location:

Selection: 1



Tile

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Amplitude 8.0 %

Speed 4.0

Age 37.0 sec.

Viscosity 2.0 %

Peaks 1.0 %

u: 0.47479 v: 0.5339

Ripple Type:

Direction:

- ☐ Circular
☐ Linear
☒ Random



Curl 0.0 %

Smoothness 40.0 %

Overall:

Amplitude 0.0 %

☐ Caustics

Randomness 10.0





Import As 3DMesh

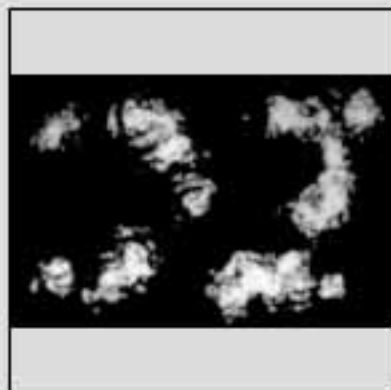


Image Information:

AlgeCyber.pict

Pixels	250 w	by	167 h
Inches	3.47 w	by	2.32 h

MESH

Grid Divisions	250	×	167	y
Size	3.472	by	2.319	in
Height	.2	in		

Type:

Sampling:

- ☒ Trimesh ☒ Point Sample
☐ Bezier Mesh ☐ Average
☒ Don't make polygons for black pixels
☐ Adjust samples to intensity

Projection:

Smoothing 68.0

- ☒ Planar
☐ Spherical
☐ Cylindrical



Cancel

OK

Front

GL Flat







Top

GL Flat



Top

GL Shaded



Object Properties

Object

Transform

Texture



Camera-1

Target:

None

Ratio: Custom

Track:

No Link

Type: Normal

Host:

None

☐ Field depth

Range: 30 in

View angle: 46.0°



Roll

Blur:



Shutter:

1/60sec

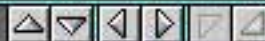
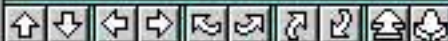
Blur quality:



Camera-1

GL Shaded

Custom





Environment

Lights

Background

Air

Ground



Add

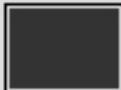
Delete



Intensity



Color



Shadows

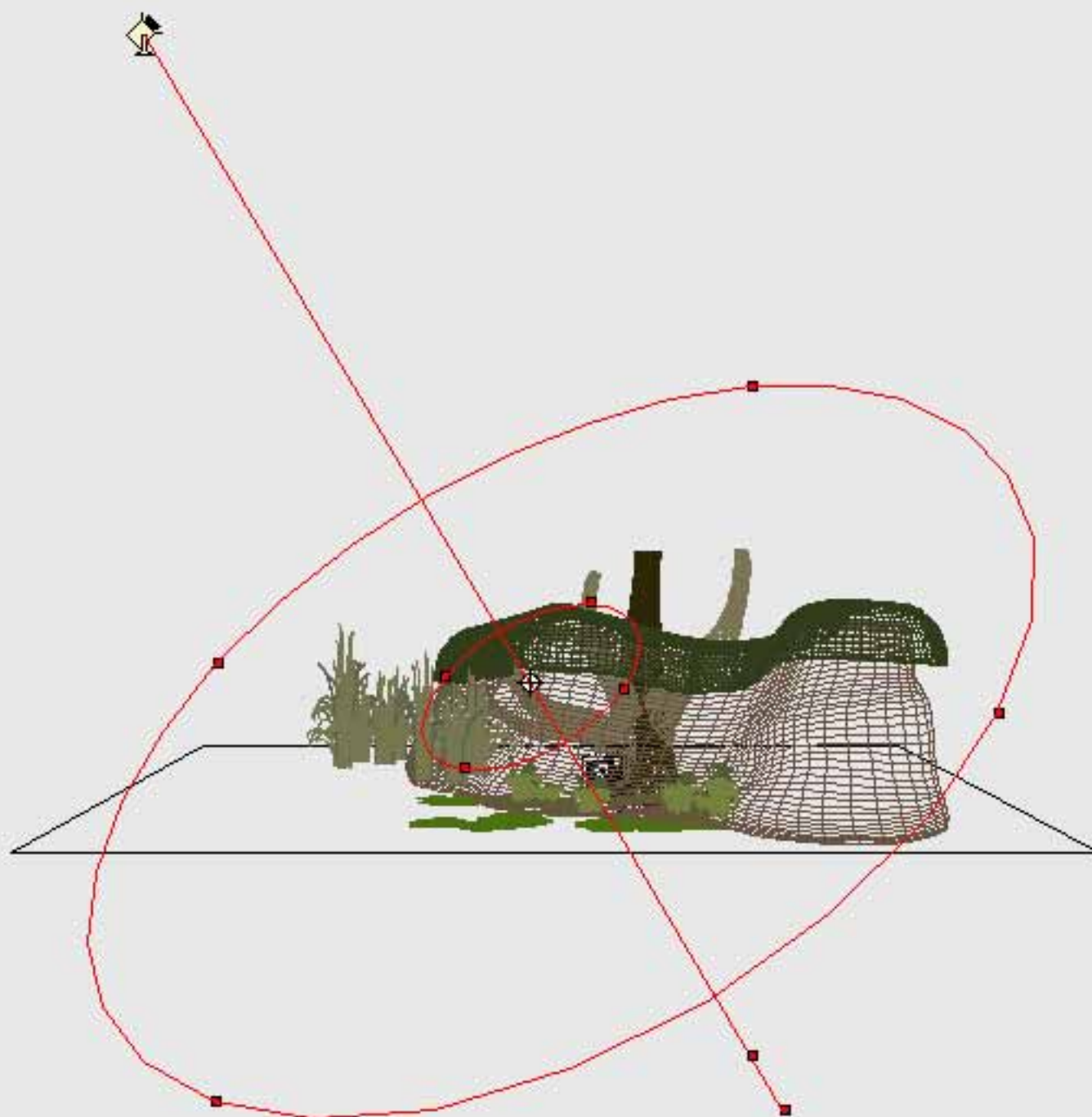
FX

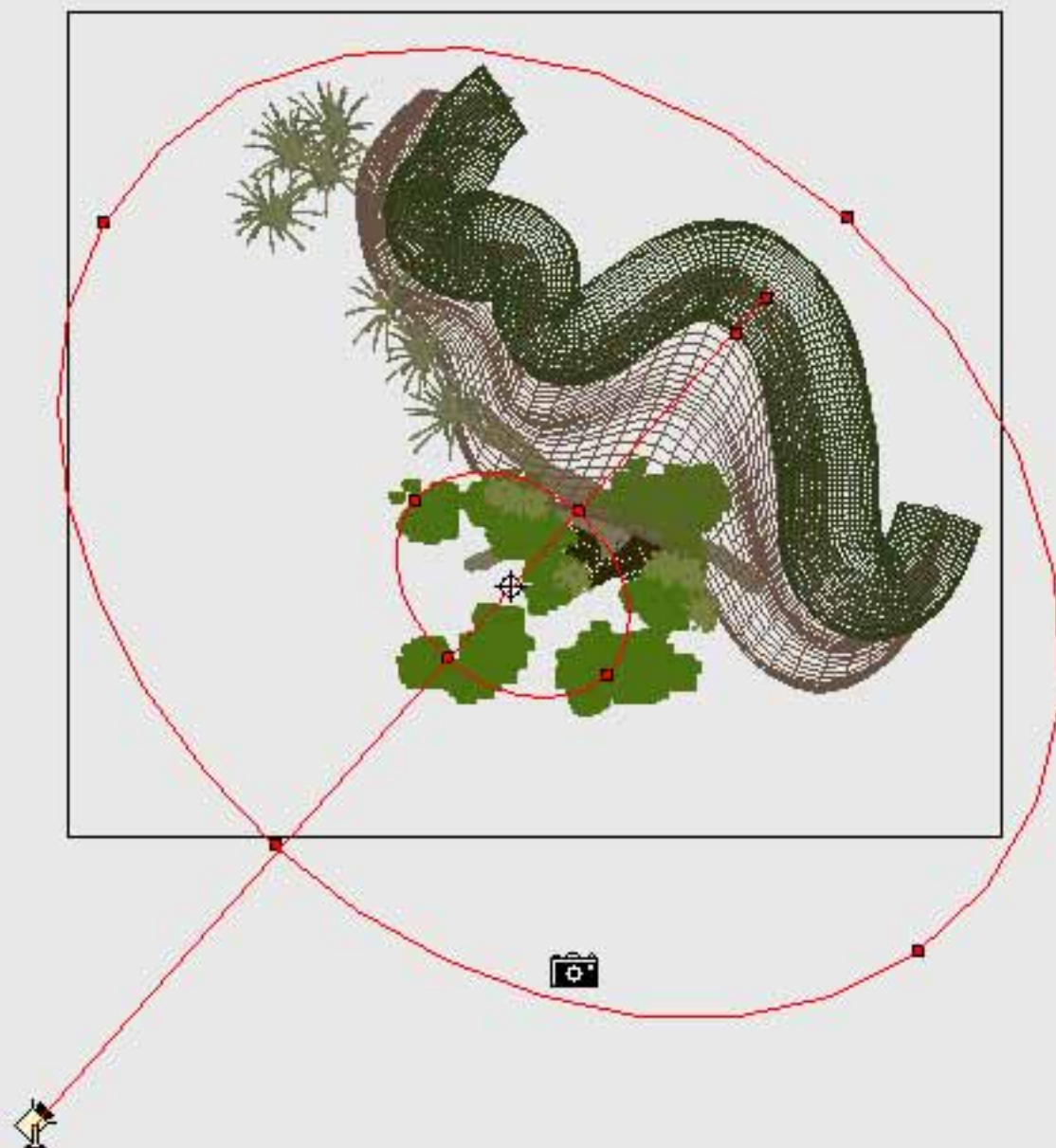
Ambient

Gel

Front

GL WireFrame





Object Properties

Object Transform Texture

Spot Light-1

100.0 %



Color



Gel



FX

Light source radius : 1.0 in

Target: None

Host: None

Track: No Link



19.3 ° Roll

Edge softness:

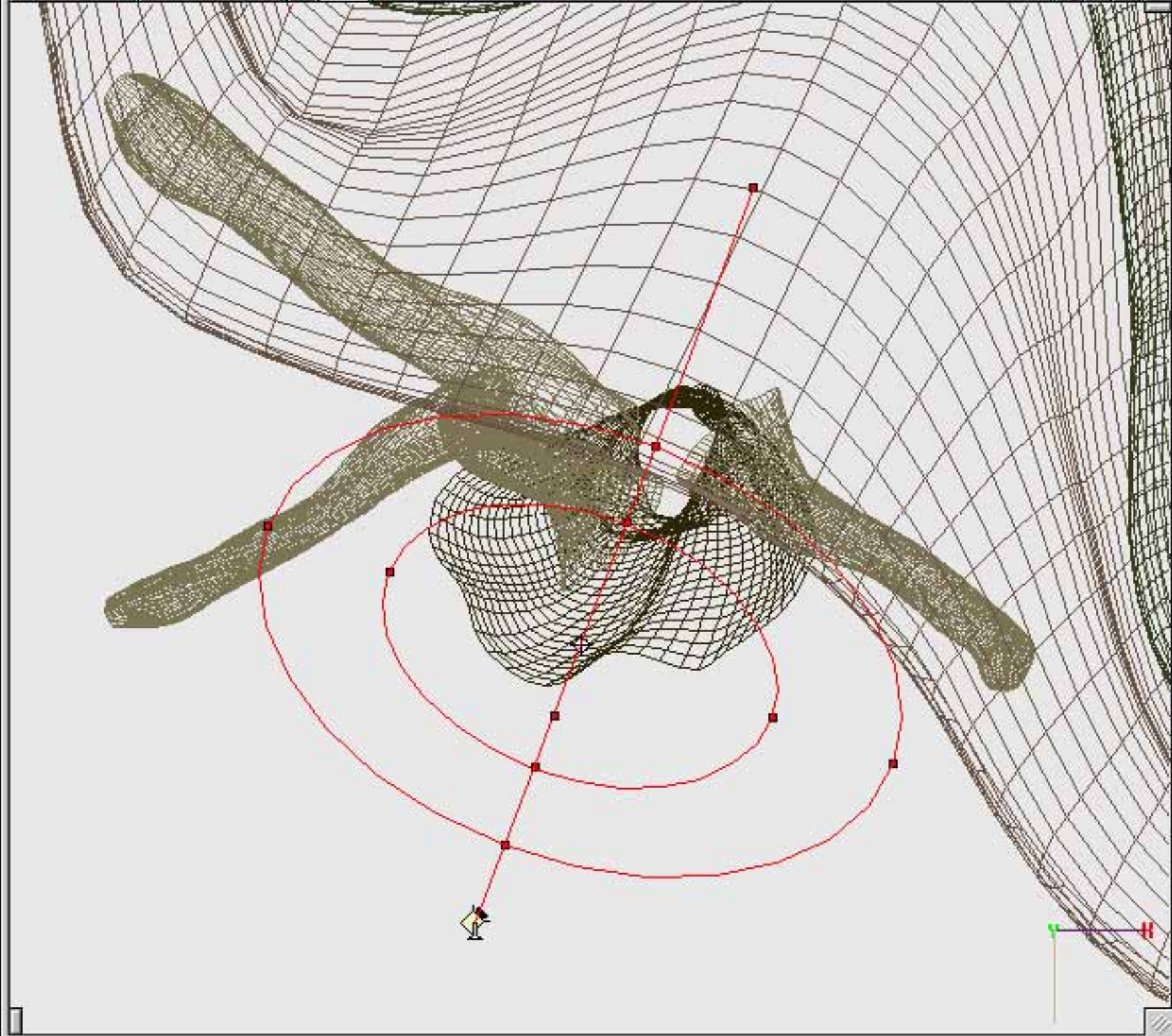
Fall - off: Exponential



Shadows

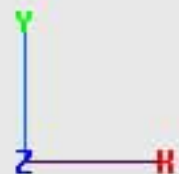
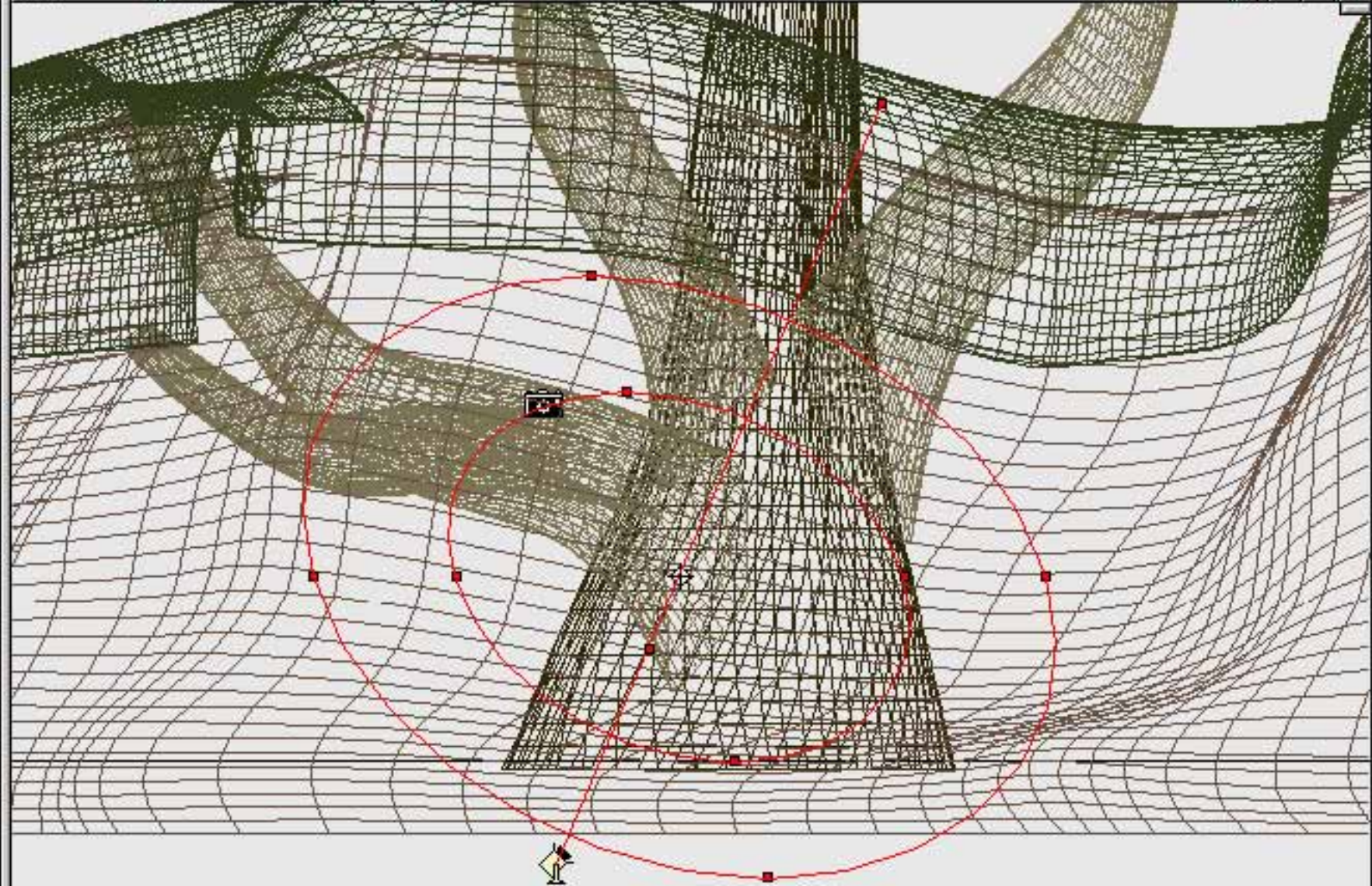
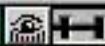
Top

GL WireFrame

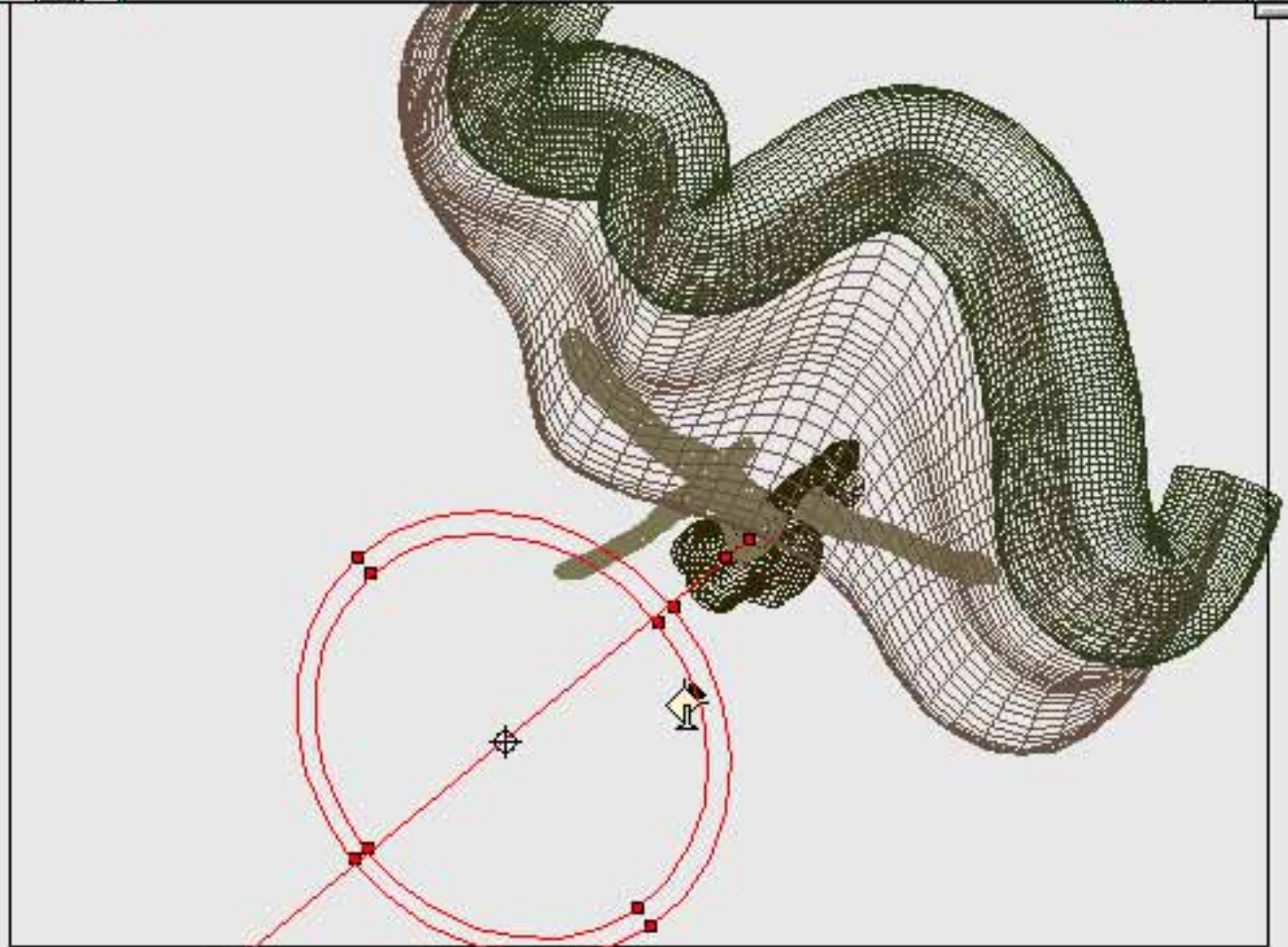


Front

GL WireFrame

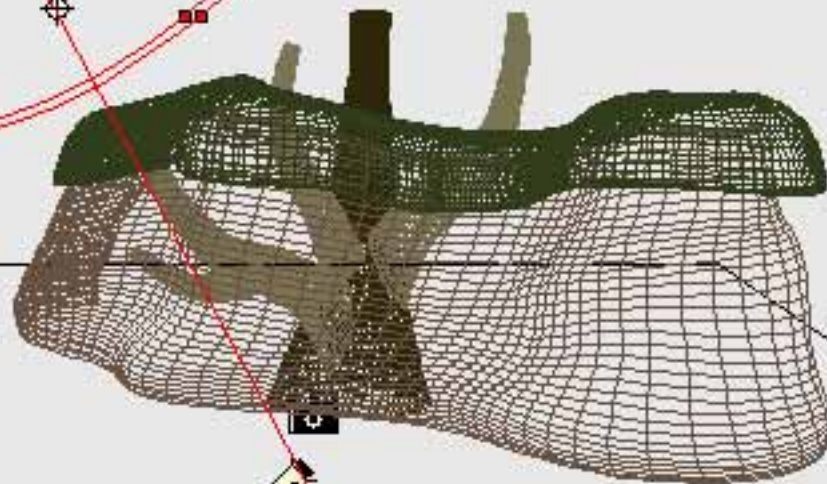






Front

GL WireFrame



Fog

Edit at: ☐ Current Time ☒ All Time ☐ Custom

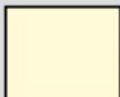
00:00:00

Fog-1

Max depth: 30.0 in

Copy from...

Start depth: 0.1 in



Density 35.0 %



Color

Direct

Ambient

☐ Logarithmic

☒ Linear

☒ Enable shadows

☒ Link colors



Tile

Apply

Cancel

OK

Render

Settings: RT Good

Renderer: Raytracing

Expert...

Texture detail: Medium

☐ Disable particle pre-roll

Oversampling: None

☐ Anti-alias filter

☒ Render Alpha Channel

Save...

☒ Current Frame

☐ All

☐ From

:

to

:

Units: Pixels

☒ Constrain proportions

Size: Custom

510

by

335

at

??

dpi

Approx. 667 k needed for image.

☐ Field Rate

☒ Start with Upper

☐ Start with Lower

☐ Maintain output settings

Light handling: Scaled



Debug

Cancel

Suspend

Render

Raytracing Esoterica

Maximum reflectivity recursion:

1

Maximum transparency recursion:

6

Maximum visible light samples:

32

Visible light threshold:

8.0

Maximum tracing block size:

16

Maximum octree height:

9

Block/volume subdivision threshold:

13

☐ Interpolate polygon mesh shadows

☒ Cast volume shadows

☒ Allow shadow buffer for volumes

Shadow softness:

1.0

☐ Render splines as polygons

☐ Flatten data base

Cancel

OK

