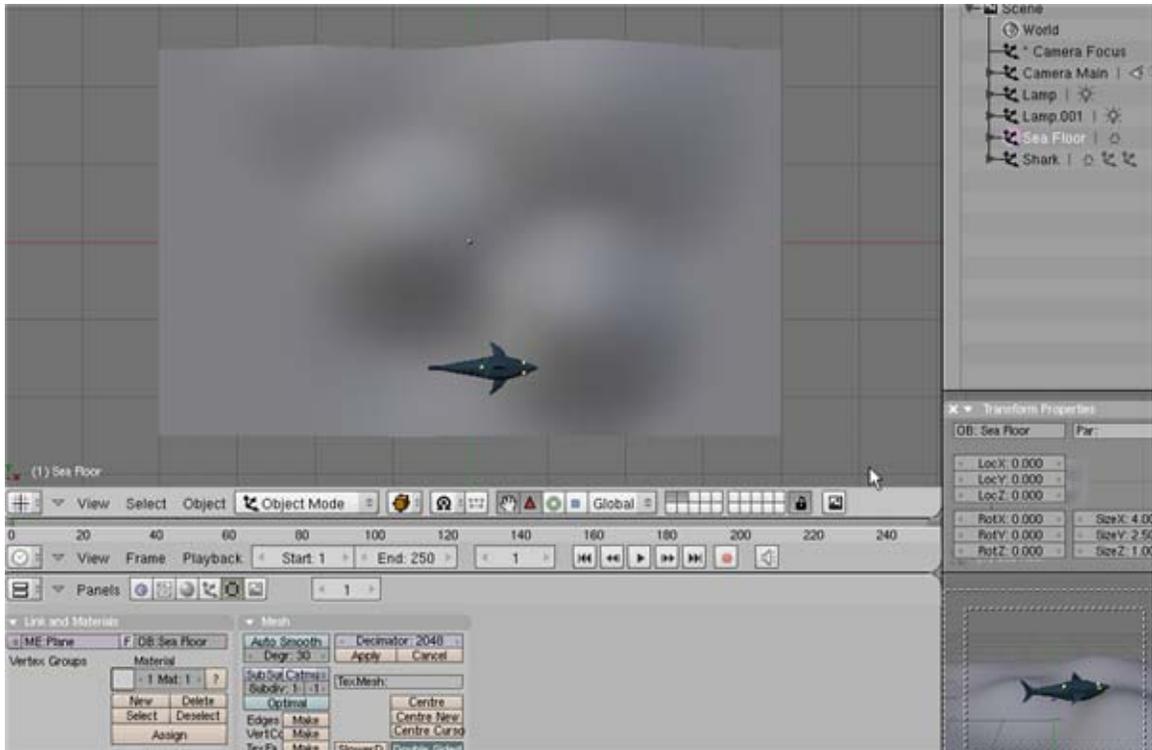


Course: 3D Design
Title: Animation – Shark Animation
Dropbox File: SharkAnimation.zip
Blender: Version 2.41
Level: Beginning
Author: Neal Hirsig (nhirsig@tufts.edu)

Animation – Shark Animation

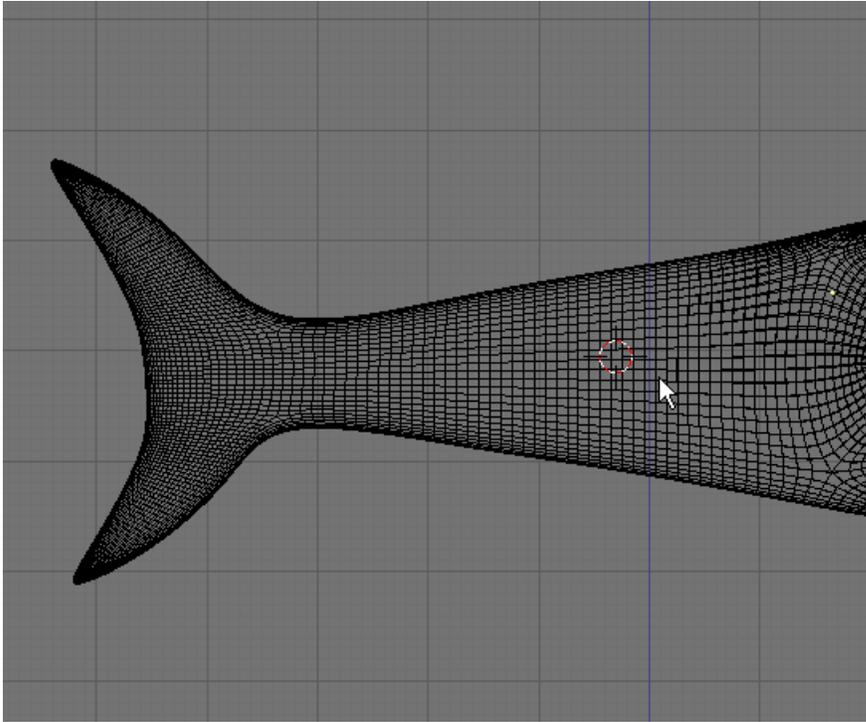


In this tutorial, we will animate a shark model created in an earlier tutorial and place it in an underwater scene which was also modeled in an earlier tutorial. Open SharkAnimation.blend. This file is located in the SharkAnimation.zip file. It is a copy of the UnderwaterComplete.blend file with the Shark model (SharkComplete.blend) appended into it.

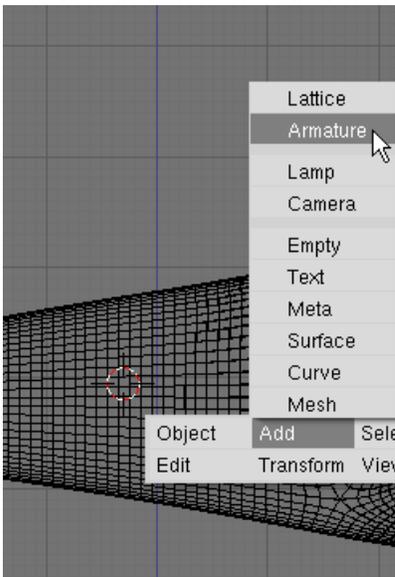


The 3D viewport displays the Top View. The Shark object (which is a parent to the right and left eye objects) is located on Layer 1. The Sea Floor object is located on Layer 2. The Camera and Camera Focus objects are located on Layer 10 and the Lighting objects (1 Spot and 1 Lamp) are located on Layer 20.

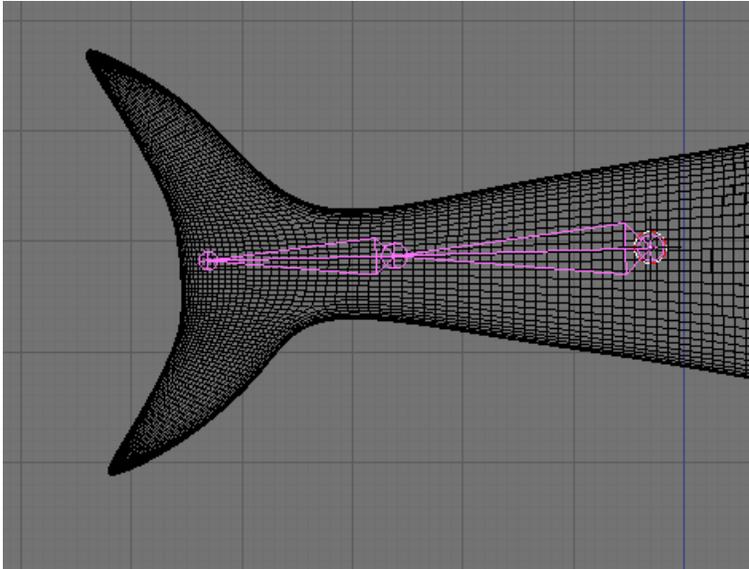
Switch to Front View. Zoom in on the Shark. Press the ZKEY to view the display in wireframe mode. Place your 3D cursor on the shark as shown below.



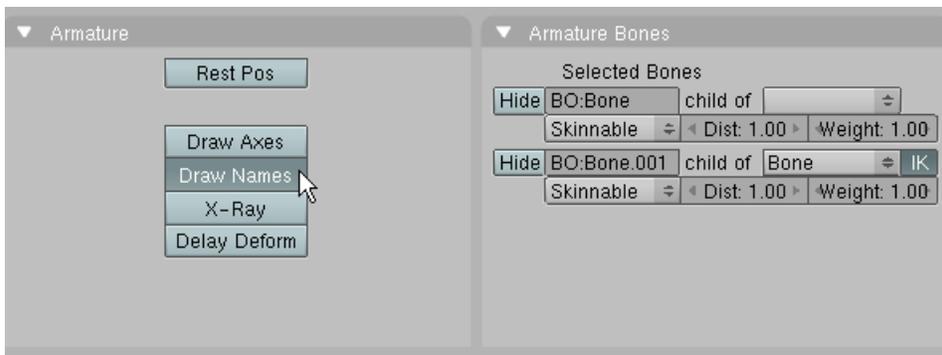
Press Space / Add / Armature/



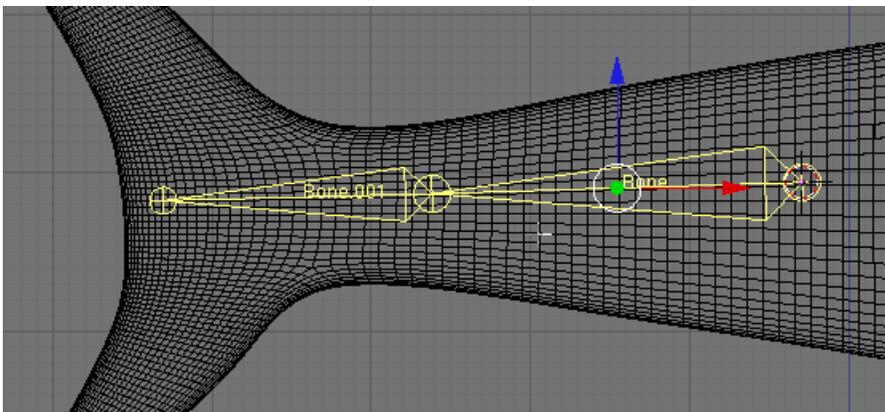
The start of a bone object will be created at the point of the cursor. Move your cursor to the left and LMB click to finish the first bone as shown. Move your cursor further to the left and LMB click to set the second bone as shown. After setting the second bone press the ESC KEY to stop the bone creation mode.



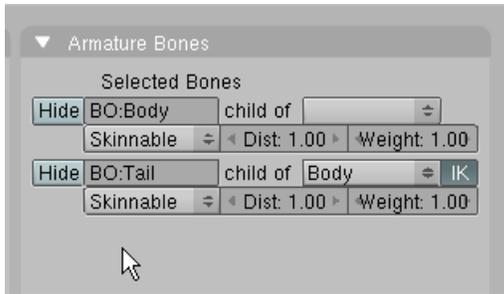
Press the **A**KEY to select the bones (Blender automatically places the bones in edit mode upon creation). In the Armature Panel Press the Draw Names button.



The names of the Bones are now displayed. The first is named Bone and the second Bone 001.

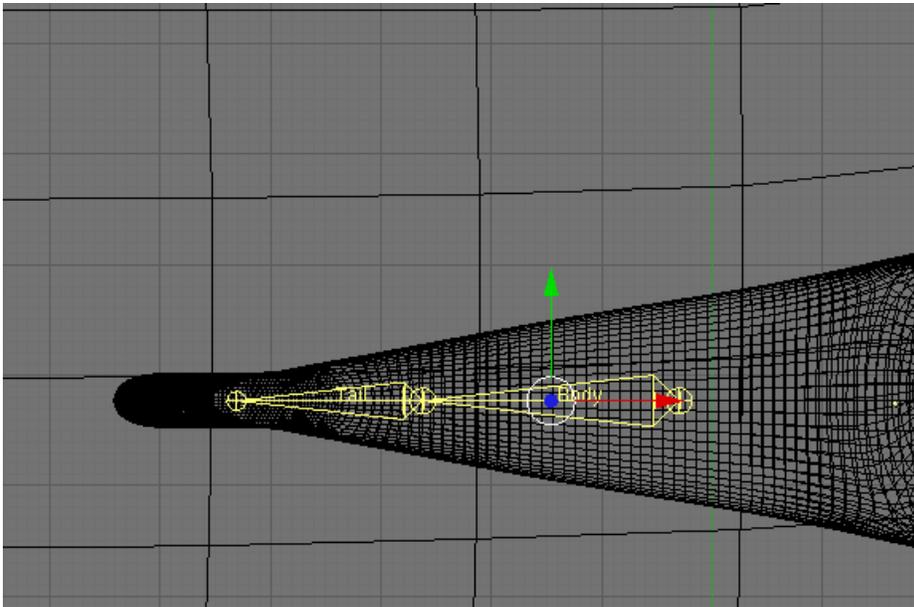


In the Armature Bones Panel rename the first bone Body and the second bone Tail.



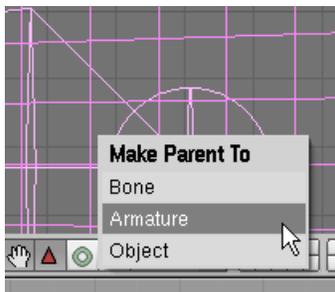
Note that the Tail bone is a child of the Body bone.

Switch to Top View. Zoom out and use the Transform Widget to move the bones (in top view) so that they are inside of the Shark object.

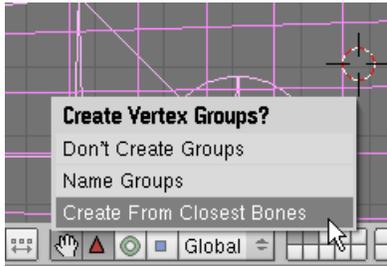


TAB out of Edit Mode. Press the AKEY to deselect the objects. Select the Shark object. Hold down the SHIFT KEY and select the Armature adding to the selection. (This might be hard to do and you may have to zoom in very tight)

Press CTRL-P and choose Make Parent to Armature

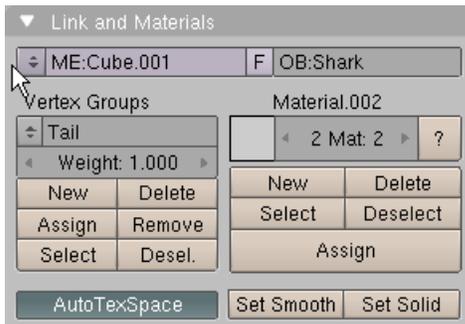


A second menu will pop-up. Select Create From Closest Bones

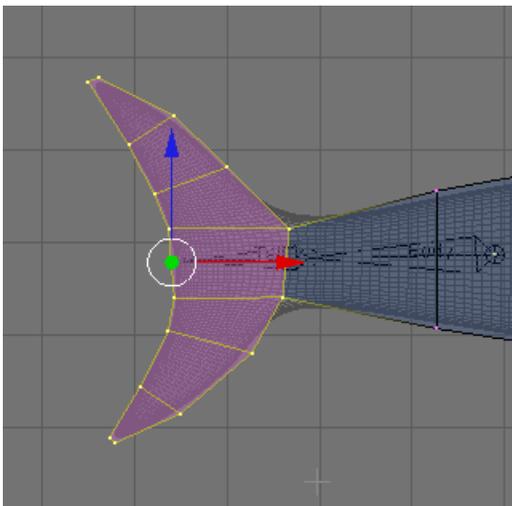


This will automatically assign vertices close to the individual bones to be associated with them.

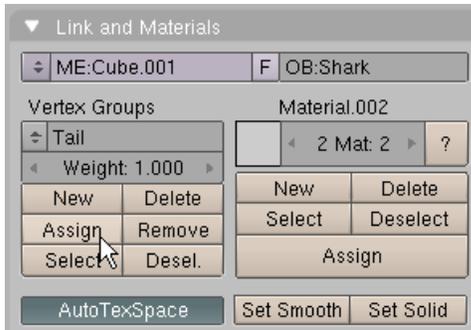
Press the AKEY to deselect the objects. Select the Shark object. TAB to Edit Mode. Note that in the Link and Materials Panel there is a section called “Vertex Groups”. Note that Tail (the name we assigned to one of our bones) is the default group.



Press the AKEY to deselect the vertices. Switch to front view. Pres the BKEY and box select the tail vertices as shown below.



In the Link and Materials Panel **under Vertex Groups** press the Assign button.

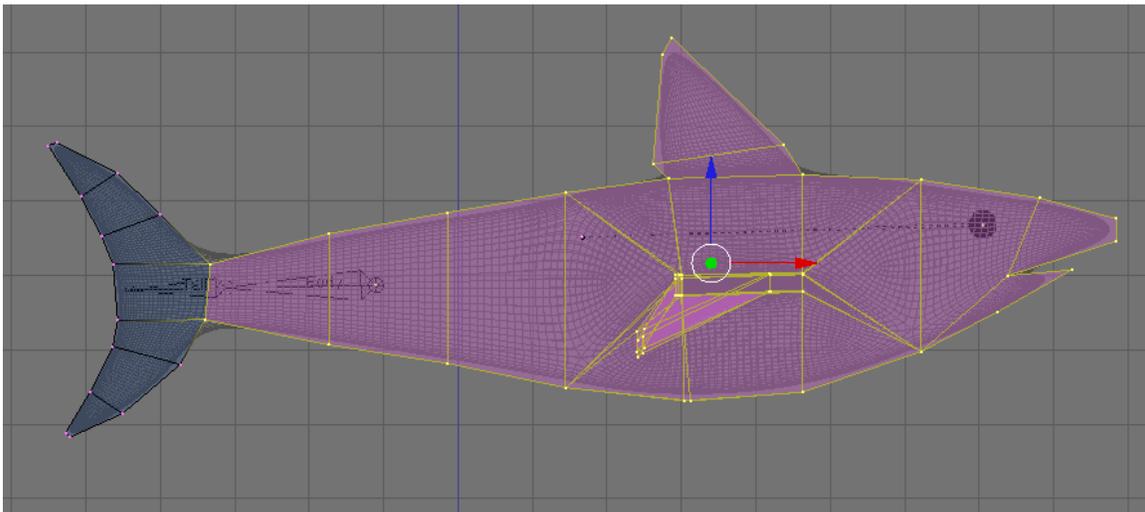


This assigns the selected vertices to be controlled by the Tail bone.

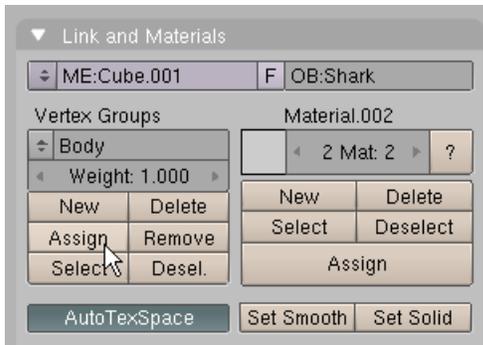
Press the dropdown box to the left of the Tail group name and choose Body.



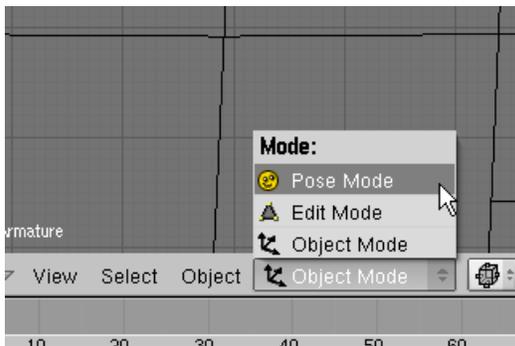
Press the AKEY to deselect the vertices. Box select the vertices as shown below.



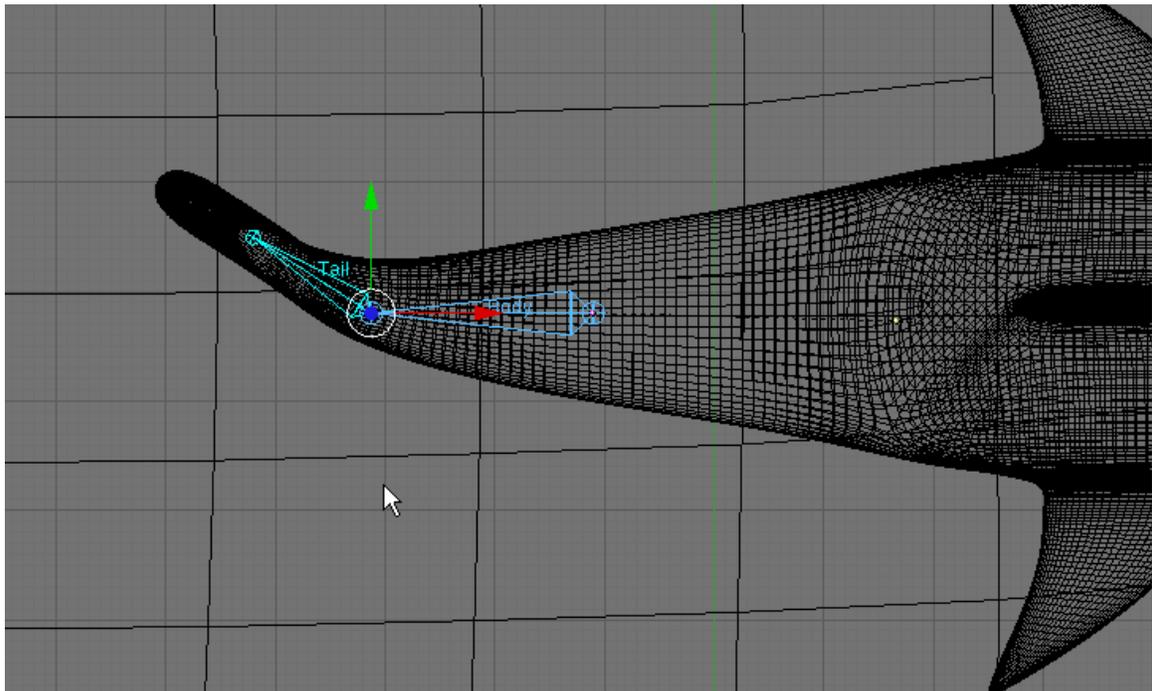
In the Link and Materials Panel **under Vertex Groups** press the Assign button.



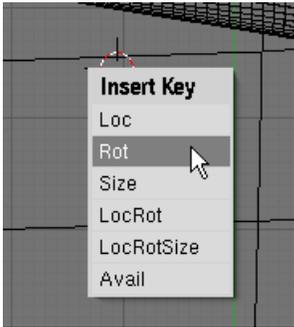
This assigns the vertices to the Body bone. Switch to top view. TAB out of Edit Mode. Select the Bone Armature. Use the Mode Dropdown box and **enter Pose Mode**.



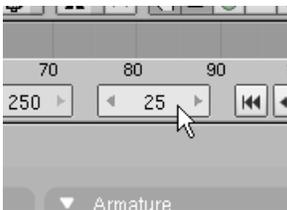
RMB select the Tail bone. Press the RKEY (Rotation) and rotate the tail bone (and the associated vertices) as shown below.



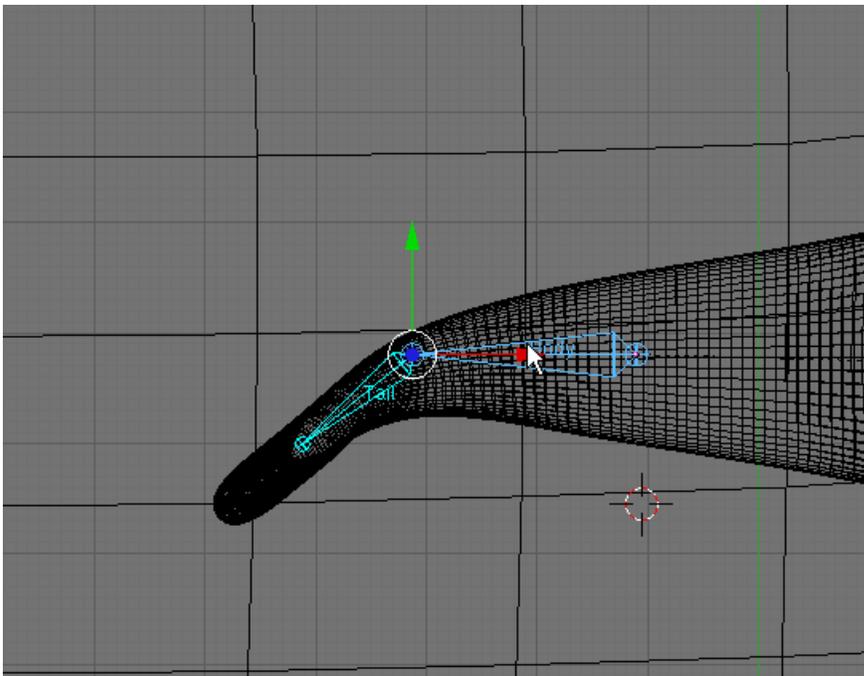
Press the AKEY (Twice) to select both bones. Press the IKEY (Insert keyframe). Choose Rot.



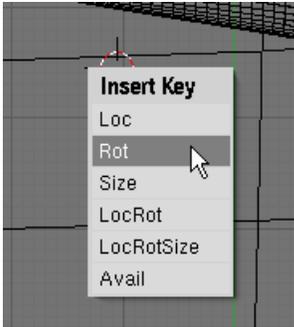
This records the rotation of the bone armature in frame 1. Set the current Frame to 25.



Press the AKEY to deselect the bones. RMB select the Tail bone. Press the RKEY (Rotation) and rotate the tail bone (and the associated vertices) as shown below.

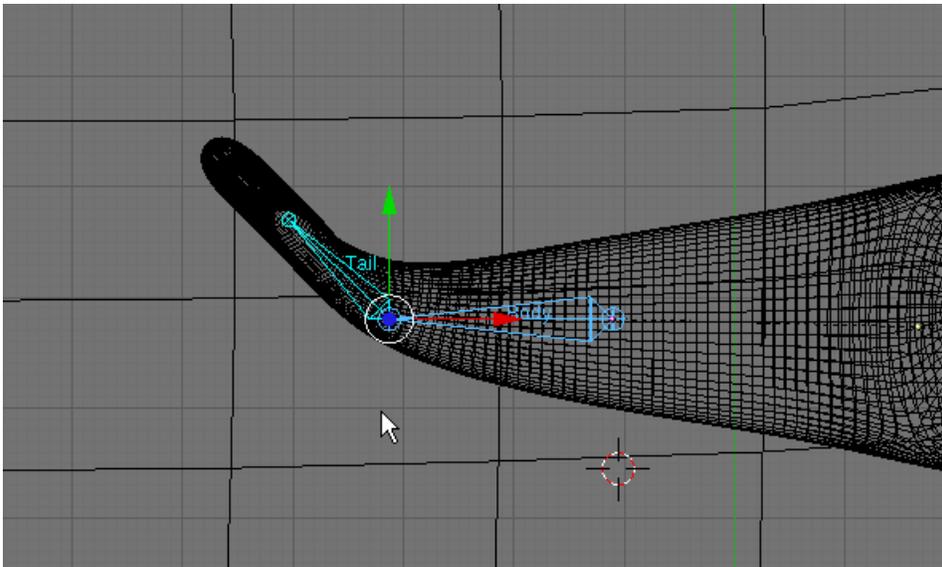


Press the AKEY (Twice) to select both bones. Press the IKEY (Insert keyframe). Choose Rot.

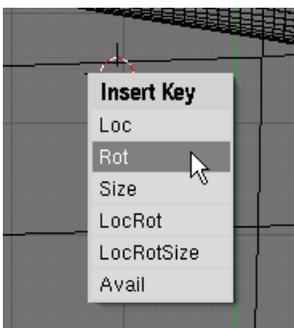


This records the rotation of the bone armature in frame 25. Set the current Frame to 50.

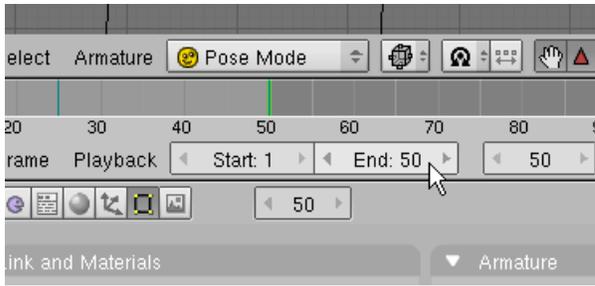
Press the AKEY to deselect the bones. RMB select the Tail bone. Press the RKEY (Rotation) and rotate the tail bone (and the associated vertices) as shown below.



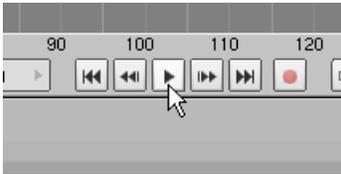
Press the AKEY (Twice) to select both bones. Press the IKEY (Insert keyframe). Choose Rot.



This records the rotation of the bone armature in frame 50. In the Animation Window set the End Frame to 50.



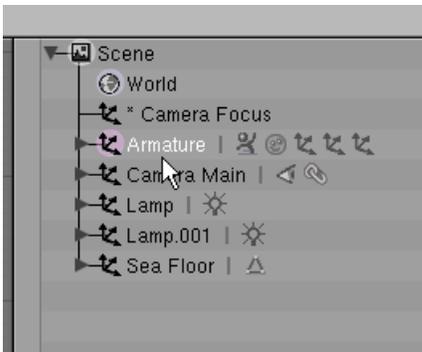
To see the animation press the play button in the animation panel.



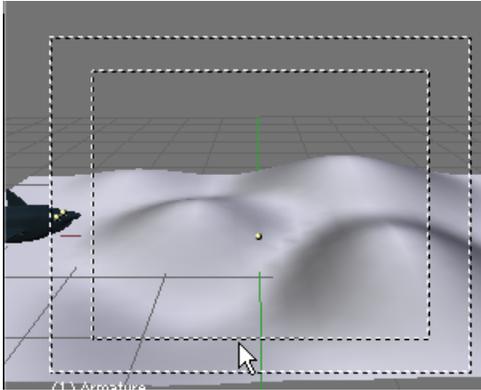
The tail rotates back and forth over 50 frames. Press the Stop but to stop the animation.



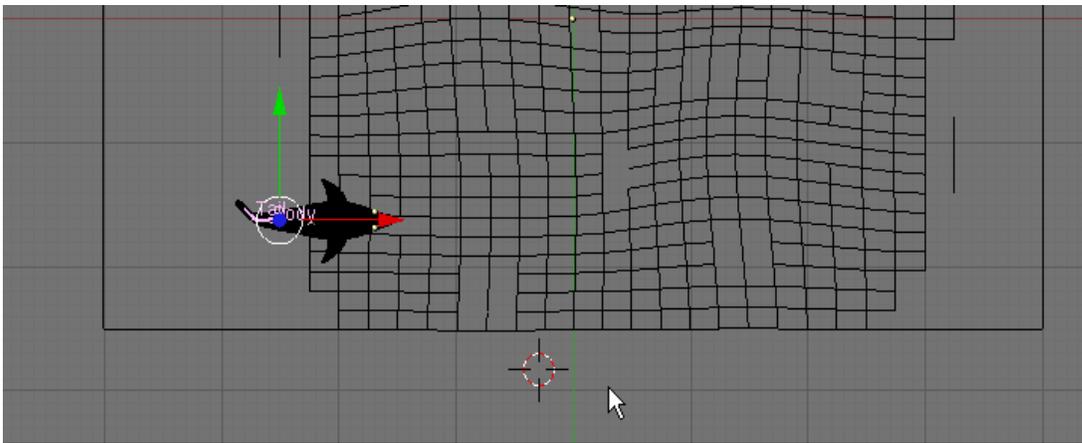
TAB TWICE to return to object mode. Press the AKEY to deselect the objects. Select the Armature from the Outliner Window. (Remember the Armature object is the parent to the Shark (which is a parent to the left and right eyes)).



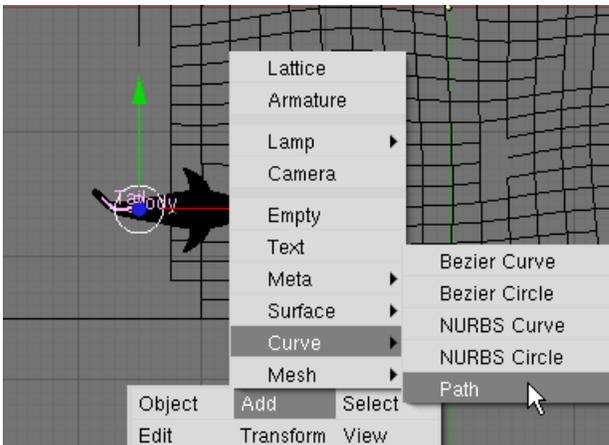
Use the Transform Widget to move the Armature object to the left so that the Shark is just outside of the camera view as shown below.



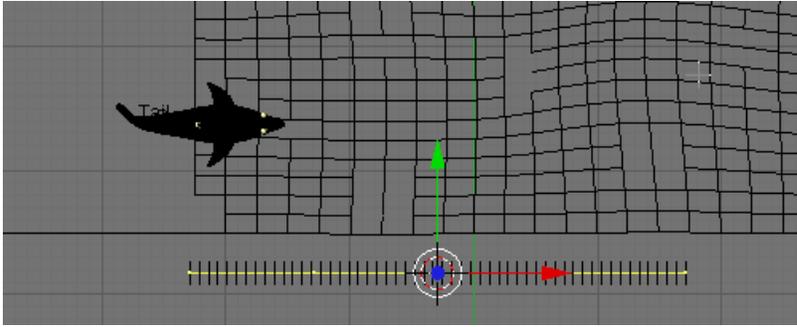
Place your 3D cursor below the Sea Floor object as shown below.



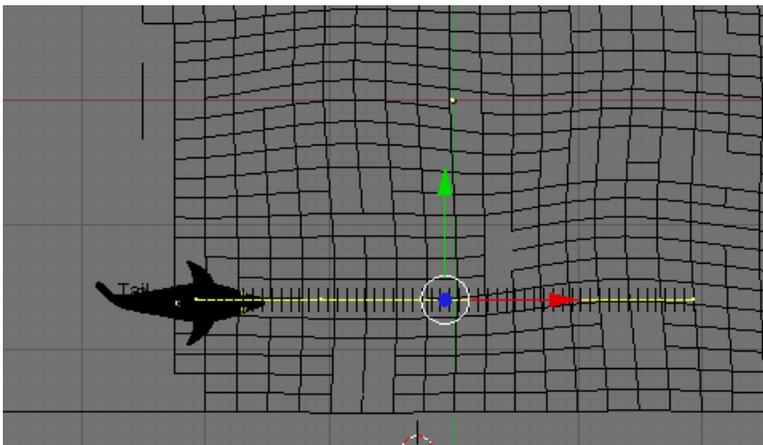
Press Space / Add / Curve / Path



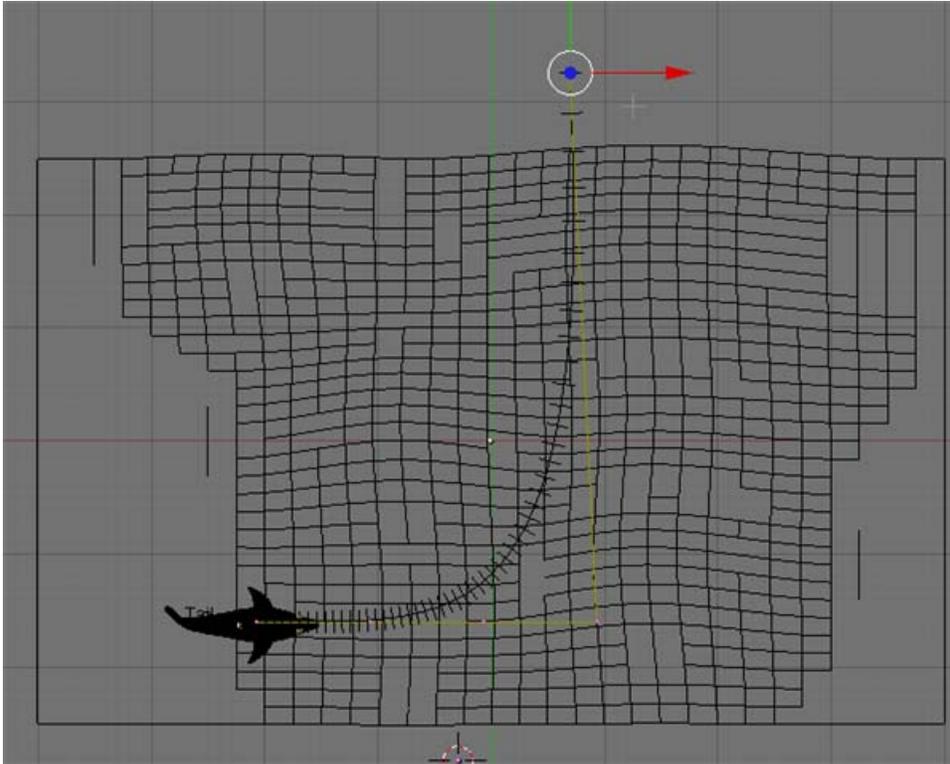
This creates a path object at the 3D cursor.



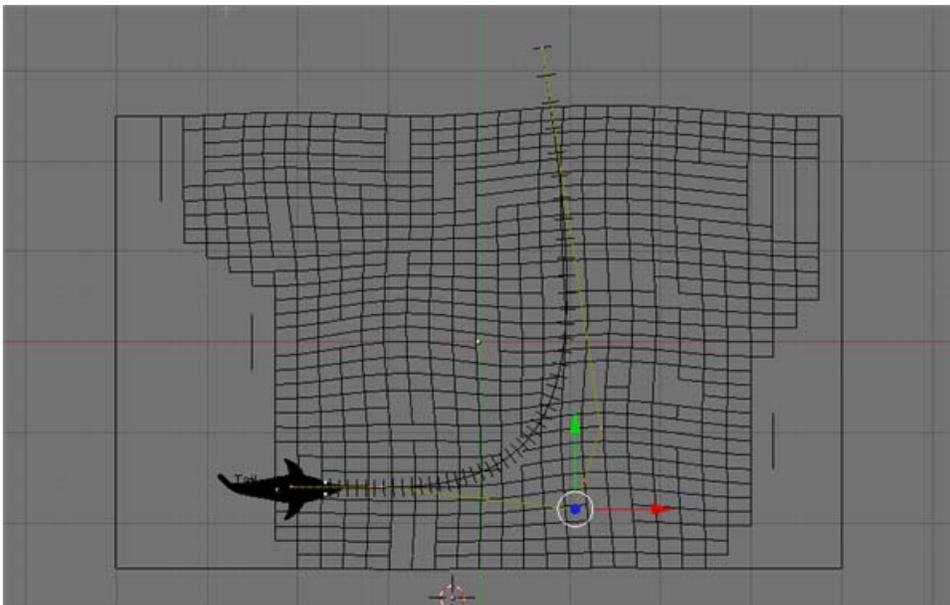
Press the GKEY (Grab) and position the Path object so that the left endpoint is in the center of the shark as shown.



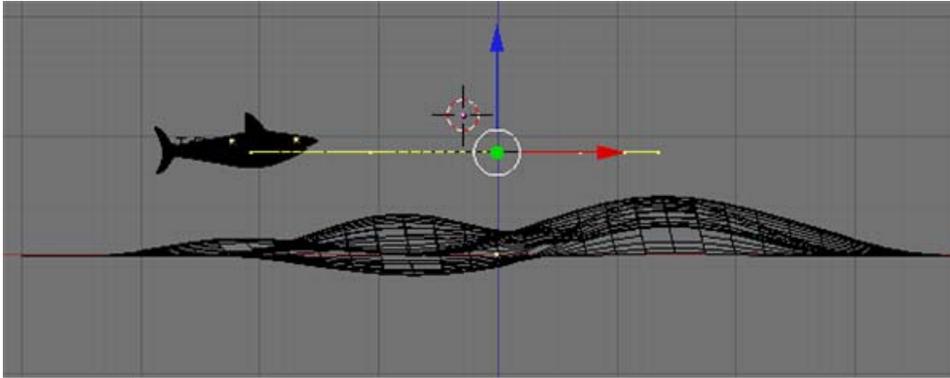
The path object has 5 control vertices. Press the AKEY to deselect the control vertices. RMB click select the rightmost control vertex. Press the GKEY and move it to the top of the Sea Floor as shown below.



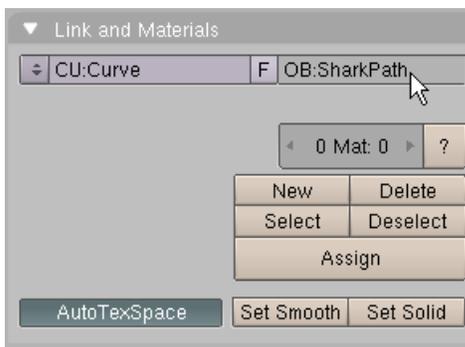
Adjust the position of the control vertices so that they look as shown below.



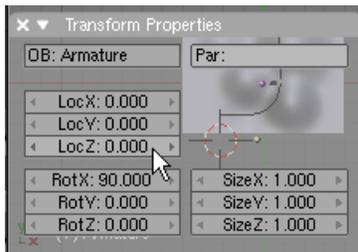
Press the AKEY to select all of the control vertices. Switch to Front View and use the Transform Widget to lower the path a bit as shown below.



Tab out of Edit Mode. In the Link and Materials Panel name the path SharkPath.

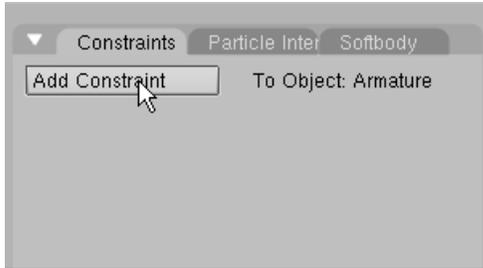


Press the **A**KEY to deselect the objects. Select the Armature alone. In the Transform Properties Panel set the LOC X, Y and Z to 0.

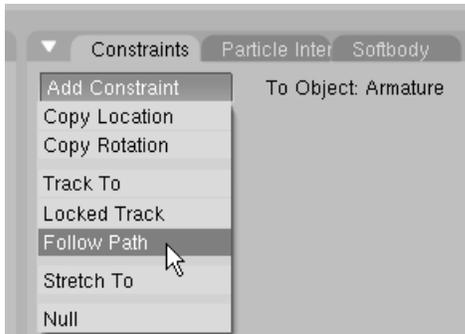


We will be constraining the armature to the SharkPath. To do this the armature object must be located initially at XYZ=0.

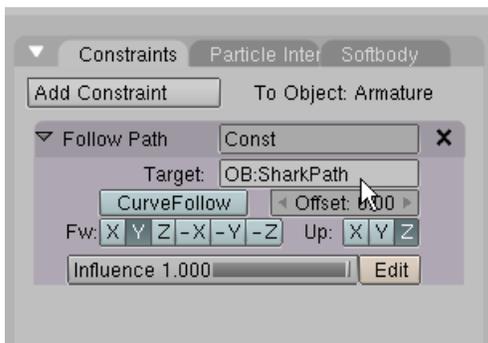
TAB to Edit Mode. Press F7 (Object). In the Constraints Panel press the Add Constraint button.



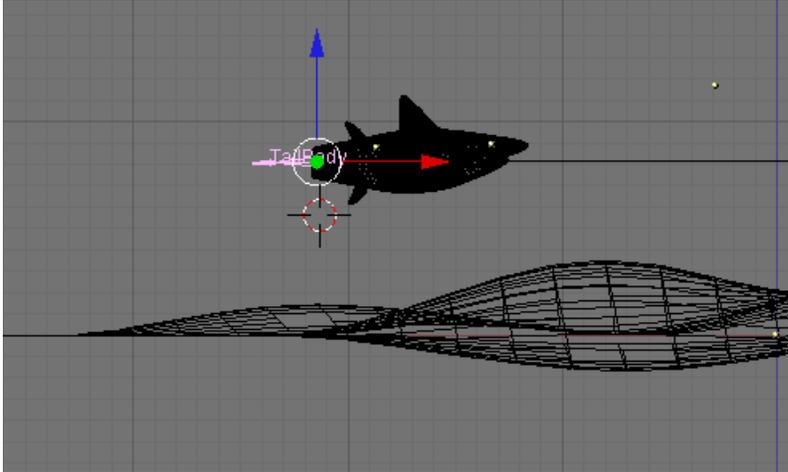
Select Follow Path.



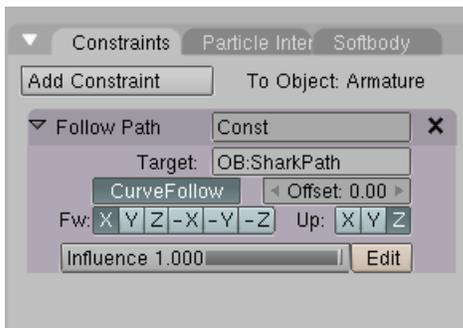
In the Object box type SharkPath and press ENTER



The Armature (and the shark) will jump to the start of the SharkPath curve.



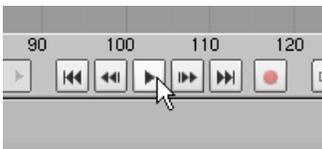
In the Constraint Panel press the Follow Path button and set the Fw to X and the Up to Z.



The shark will now follow the path which by default is 100 frames long. In the Animation Window set the End Frame to 300.

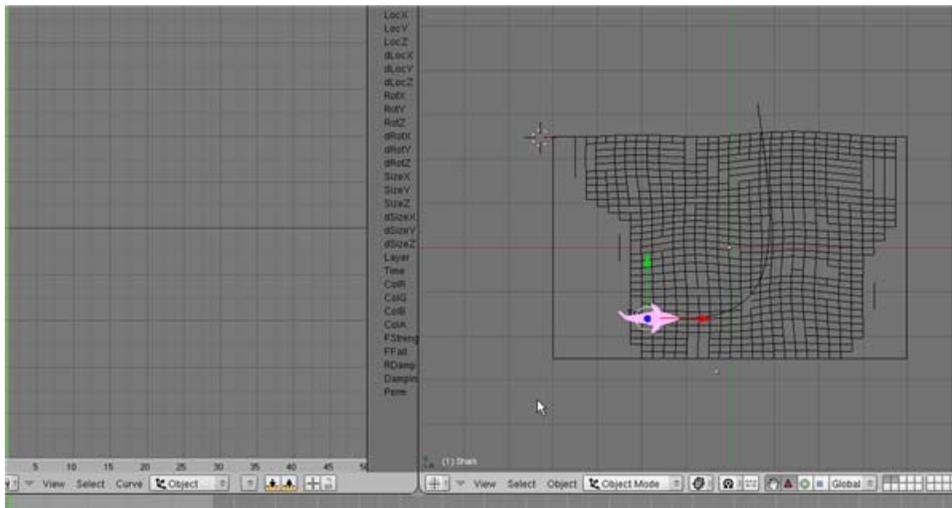
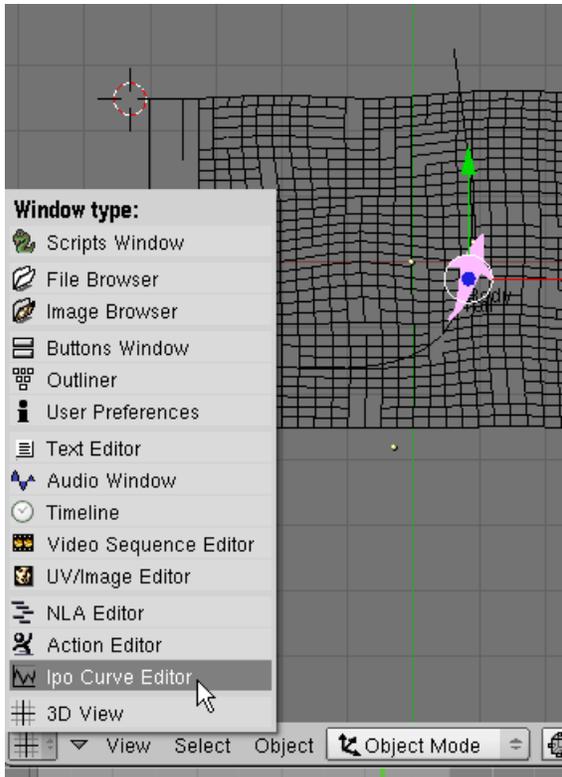


In the Animation Window press the Play button.

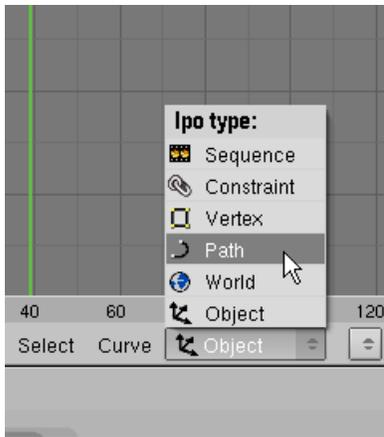


Press the Stop button to stop.

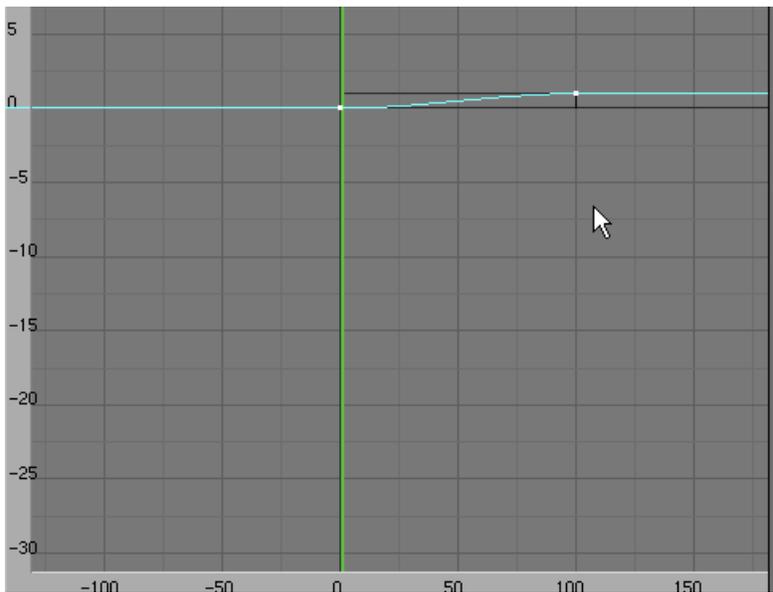
Even though the whole animation is 300 frames long the shark follows the path over the default 100 frames (Note: For the first 50 frames the shark's tail moves from side to side.) To change the length of a path animation we need to access the IPO (Interpolation) window. Split the 3D viewport and display the IPO curve editor on the left and the top view on the right.



In the Top View select the SharkPath object. In the IPO window change the IPO type to "Path"

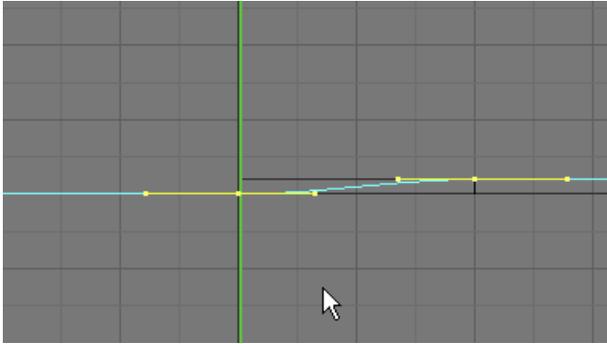


Zoom out of the IPO Window. Notice that a control curve is displayed on a channel call “Speed”

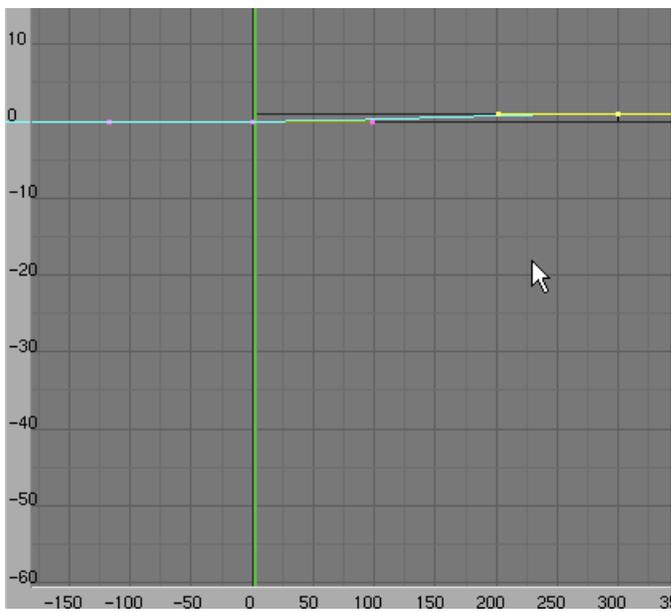


The curve extends from “0” to “1”. You can run (click and drag) the orange current frame line to see the animation.

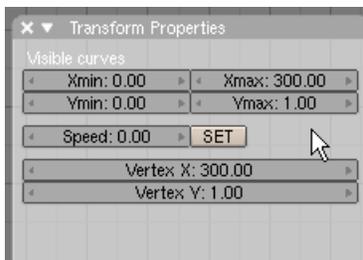
With the IPO Window active, press the TAB key to enter Edit Mode.



Zoom out a bit so you can see frame 300. Select the control point on the right (frame 100). Press the GKEY and move it to frame 300.



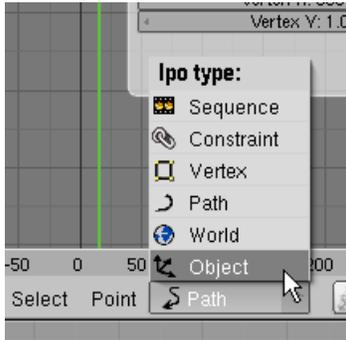
It is difficult to see this so with the control point still selected press the NKEY (Transform Properties) and set Xmax and Vertex X to 300 and Ymax and Vertex Y to 1.



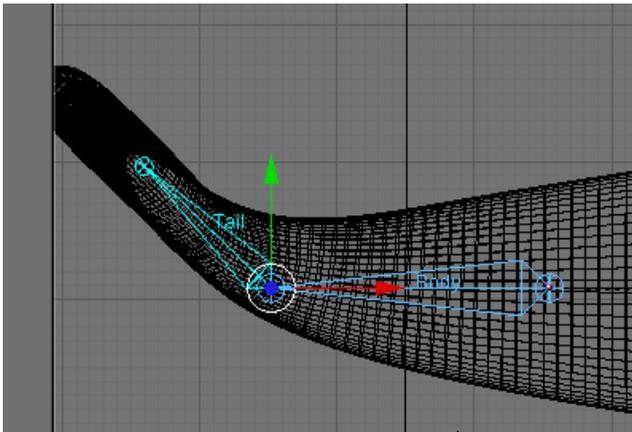
Press TAB to leave Edit Mode.

The shark will now follow the path in 300 frames. (Press the play/stop in the top view to see animation).

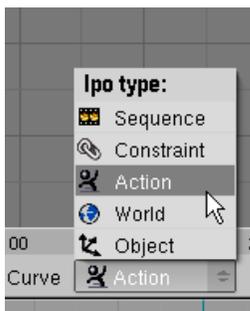
Next we have to extend the animation of the Tailbone over the complete 300 frames. In the IPO Window switch back to Object.



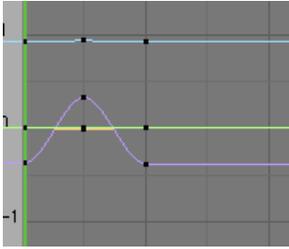
In the Top View. Press the AKEY to deselect the objects. Zoom in on the Armature area. Select the Armature alone. **CRTL-TAB to Pose Mode**. Select the Tail bone.



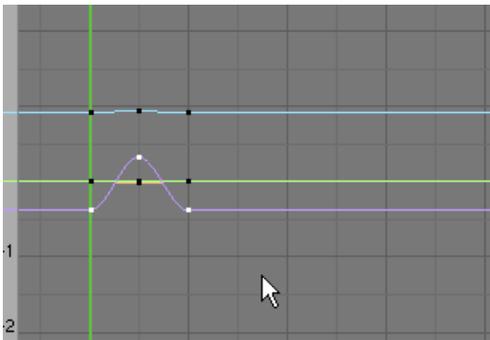
In the IPO Window change the IPO Type to Action.



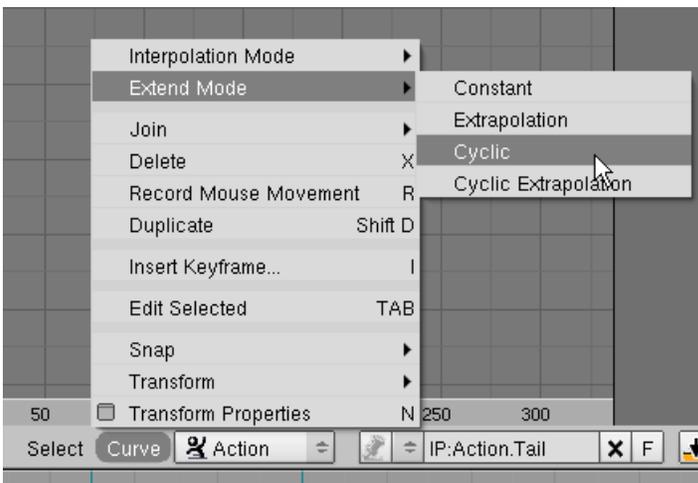
This displays the animation curve for the Tail Bone with keyframe control points at 1, 25 and 50.



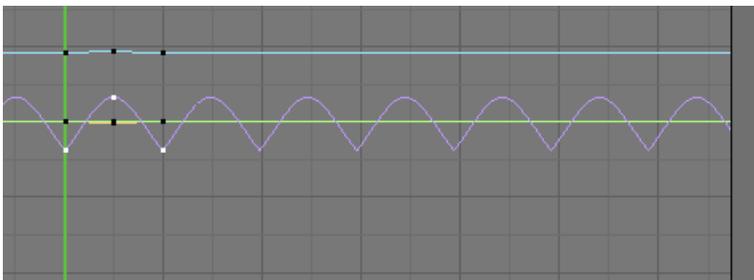
The bottom curve is the X axis channel that recorded the rotation in frames 1, 25 and 50. Select this curve (the control points will turn white).



Press Curve / Extended Mode / Cyclic



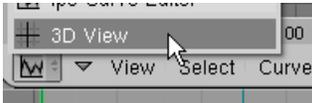
This repeats the curve for the duration of the animation.



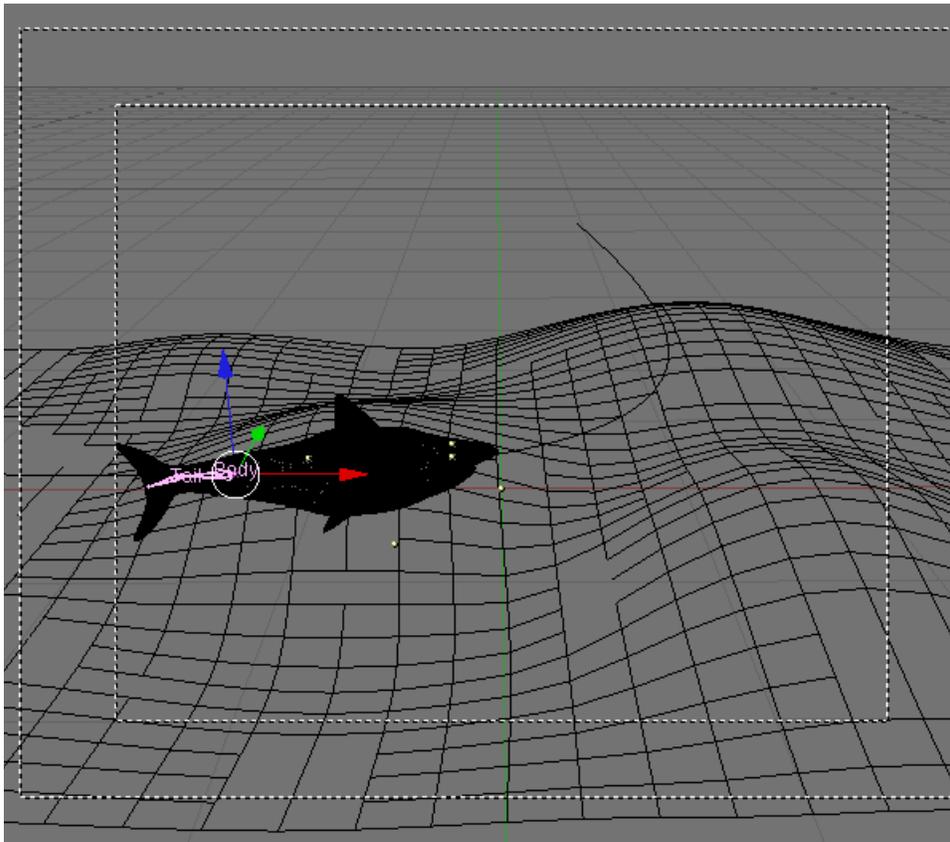
Note: Even though the curve keeps repeating itself after frame 300 it will have no effect as the animation is only 300 frames long.

Zoom out of Top view. **CTRL-TAB out of Pose Mode**. Press the AKEY to deselect the objects. Play the animation. The Shark follows the path for 300 frames and the tail sways left and right throughout the animation.

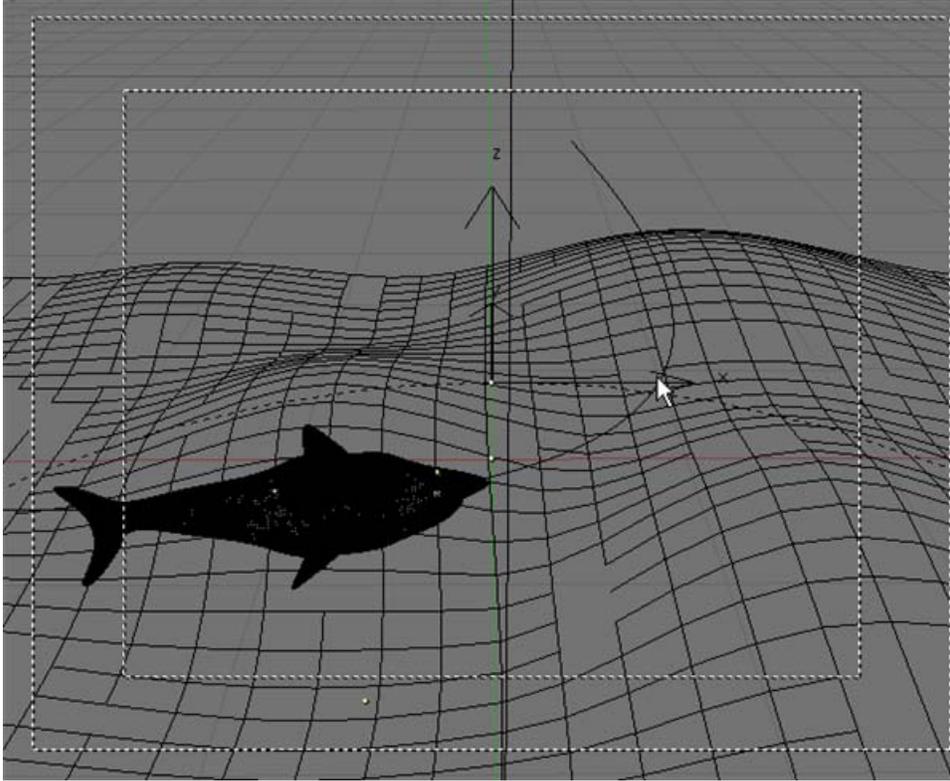
Change the IPO Window to a #D Viewport.



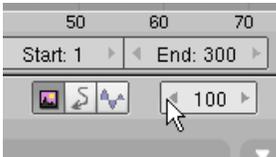
Change this viewport to Camera View. Set the current frame at 75.



In the Top viewport Add Layers 10 (Camera and camera focus) and layer 20 (lighting). Change the Top view to Side view. Select the Camera and adjust it so that the Camera view in frame 75 looks like the image below.



Set the current frame at 100



Render F12.



This is a test render of a single frame. Press F10 (Scene).

Next we will set up the Blender output for a QuickTime movie file. In the Format Panel use the file type dropdown box to select QuickTime. (Accept the default settings)



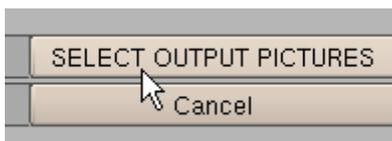
In the Output Panel press the icon to the left of the first box.



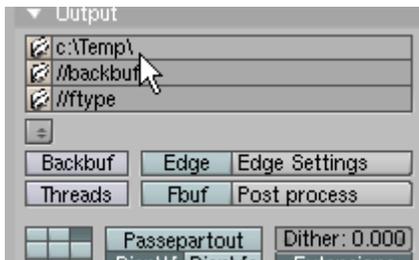
This allows us to choose a directory that will hold the QuickTime movie file. (I selected C: Temp)



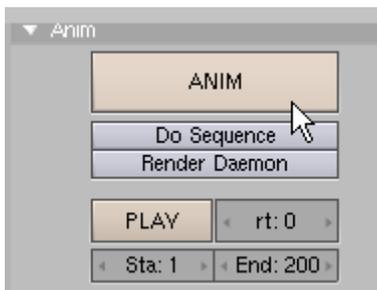
After selecting the destination directory press the Select Output Pictures button.



This sets Blender's output directory for animation files.



Note that we do not have to name this file. Blender will automatically name this file 0001_0300.mov and place the file in the output directory you have chosen. In the Animation Panel press the Animate Button.



Blender will render each frame in the display buffer and will place the 0001_0300.mov file in the output directory (Note: You can stop the rendering process at any time by pressing the ESC KEY). When finished you can play the animation in Blender by pressing the Play button or you can open the 0001_0300.mov file in your QuickTime Player.

A completed copy of this tutorial named SharkAnimationComplete.blend is located in the SharkAnimation.zip file.