




The patch tool and content-aware filling

Patch tool

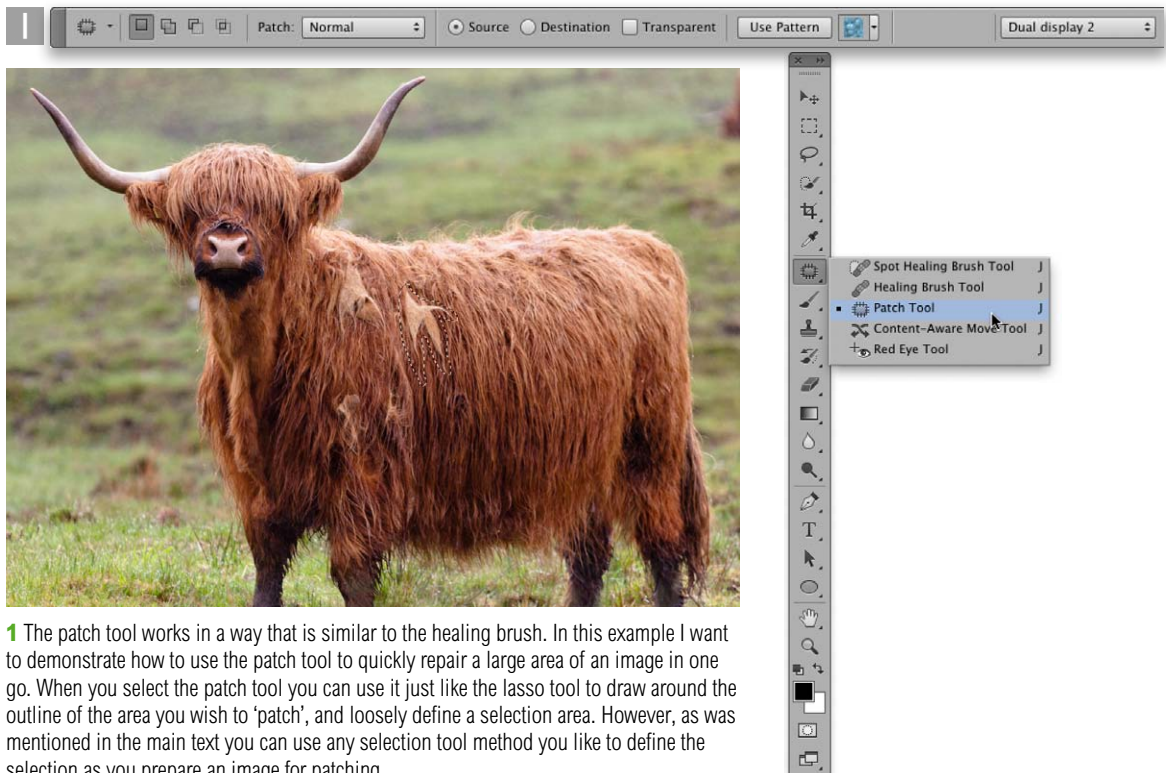
The patch tool uses the same algorithm as the healing brush to carry out its blend calculations, except the patch tool uses selection-defined areas instead of a brush. When the patch tool is selected, it initially operates in a lasso selection mode (for example, you can hold down the  **alt** key to temporarily convert the tool to become a polygonal lasso tool with which to draw straight line selection edges). The selection can be used to define the area to 'patch from' or 'patch to'. It so happens you don't actually need the patch tool to define the selection; any selection tool or selection method can be used when preparing a patch selection. Once you have made the selection, select the patch tool to proceed to the next stage. Unlike the healing brushes, the patch tool has to work with either the Background layer or a copied pixel layer. What is useful though is that the patch tool provides an image preview inside the destination selection area as you drag to define the patch selection.

Source and Destination modes

In Source mode you drag the patch tool selection area to a new destination point to replace the pixels in the original source selection area with those sampled from the new destination area. In Destination mode you drag the patch tool selection area to a new destination point to copy the pixels from the original source selection area and clone them to the new destination area.

Use Pattern option

The Use Pattern button in the Options bar lets you fill a selected area with a pattern preset using a healing type blend.



1 The patch tool works in a way that is similar to the healing brush. In this example I want to demonstrate how to use the patch tool to quickly repair a large area of an image in one go. When you select the patch tool you can use it just like the lasso tool to draw around the outline of the area you wish to 'patch', and loosely define a selection area. However, as was mentioned in the main text you can use any selection tool method you like to define the selection as you prepare an image for patching.



2 Having defined the area I wanted to patch, I made sure that the patch tool was selected (and was in Source mode) and dragged inside the selection to locate an area of the image that could be used to 'patch over' the original area (i.e. remove the matted hair). As I dragged the patch selection this created a second selection area which I could use to define the area to clone from. Meanwhile, I was able to see a live preview in the original patch selection, indicating which pixels would be cloned to this selection area.



3 As I released the mouse, Photoshop began calculating a healing blend, analyzing the pixels from the source area (that I had just defined) and used these to merge them seamlessly with the pixels in the original selection area. The patch tool repair will usually work effectively first time. If it doesn't look quite right, I suggest deselecting the selection and use either of the healing brushes (or the clone stamp) to fine-tune the result. In this final version I repeated using the patch tool to remove some of the matted clumps of hair.

Transparent mode

In Transparent mode you can use the patch tool in the Source or Destination mode to blend selected areas transparently. In the Figure 1 below you can see a before and after example where the patch tool was applied using the patch tool in Destination mode with the Transparent option checked.



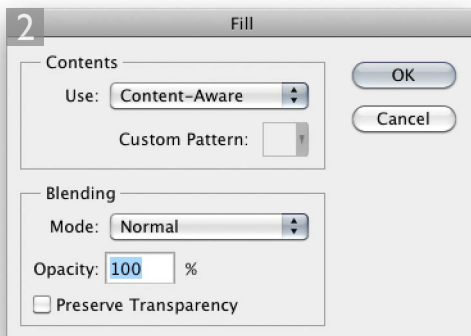
Figure 1 This shows an example of the patch tool applied in Transparent mode to copy an ice cube in a glass and have it blend transparently.

The patch tool and content-aware filling

Photoshop CS5 saw the introduction of content-aware filling. This is where you can make a selection, choose **Edit** ⇒ **Fill** and fill using the Content-Aware fill mode (as shown below). Now in Photoshop CS6, there is also a Content-Aware mode when working with the patch tool. The following steps show a comparison between the use of the **Edit** ⇒ **Fill** command and the patch tool in Content-Aware mode. Note that when the **Sample All layers** option is checked, you can apply a patch tool Content-Aware fill to an empty new layer.



1 This photograph taken at sunset and you can see the shadow of the tripod and camera. To remove this from the image, I first made a rough lasso selection to define the outline of the shadow.



2 I then went to the **Edit** menu and chose **Fill...** (or, you may find it easier to use the **Shift+F5** shortcut). This opened the Fill dialog shown here where I selected 'Content-Aware' from the pop-up menu in the Contents section. When I clicked **OK**, this filled the selected area. You can see the result of this fill at the top in Figure 2.

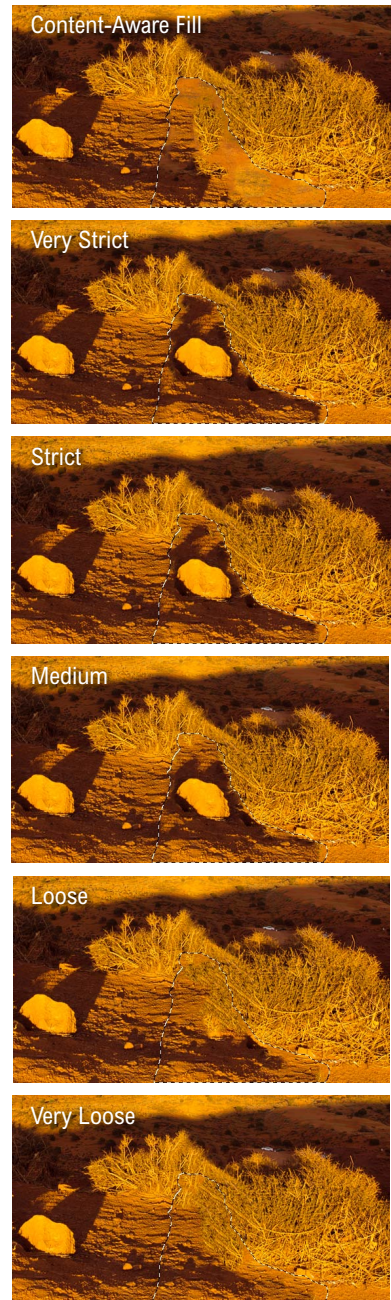
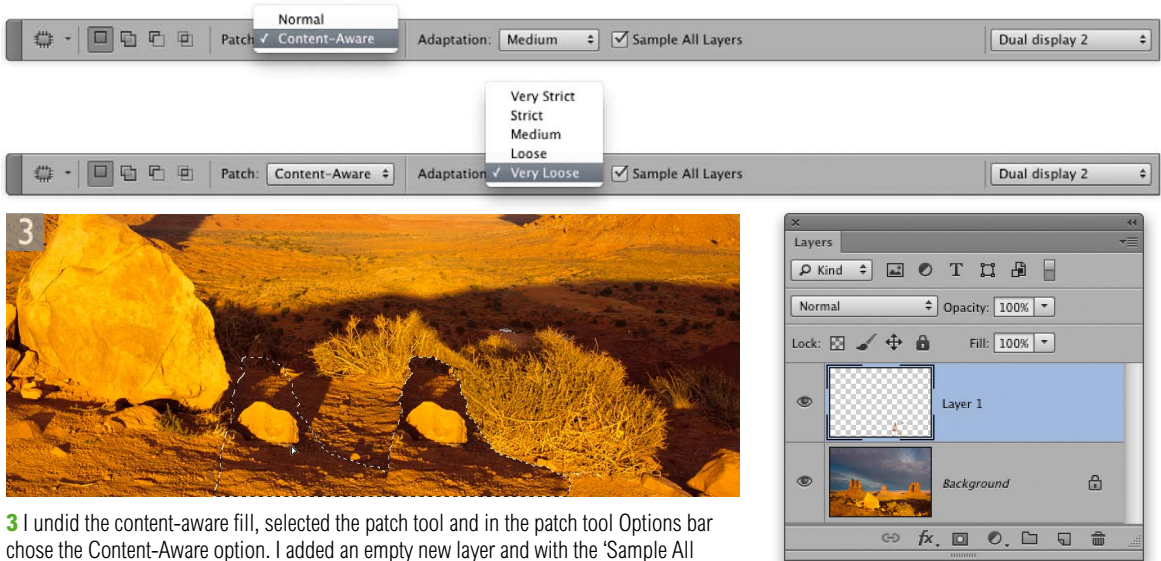


Figure 2 Examples of content-aware fill outcomes using different adaptation methods.



3 I undid the content-aware fill, selected the patch tool and in the patch tool Options bar chose the Content-Aware option. I added an empty new layer and with the 'Sample All Layers' option checked, dragged the selection to the left and released the mouse. With the selection still active, I was able to go through all the different options from the Adaptation menu, finally settling on the Very Loose option. You can see the results of all the different adaptation methods in Figure 2 on the previous page.



4 Here is the final version with the shadow successfully removed.

When you use the Content-Aware Fill feature you have no control over the adaptation mode that's used. Even so, the content-aware fill feature has been found to work well in a lot of cases. All you have to do is to make a rough selection around the outline of whatever it is that wish to remove from a scene and let the content-aware fill do the rest. Photoshop can usually work out how best to fill in the gaps in the selection and construct a convincing fill by sampling pixel information from the surrounding area. If you don't get a satisfactory result straight off, there are a couple of things you can try doing to make it work better. For example, it is recommend that you expand the selection slightly before applying a content-aware fill. You can do this by using the Refine Edge command or go to the Select menu and choose Modify ⇨ Expand. It can also help sometimes if you apply a content-aware fill more than once. As you apply subsequent fills you may see the filled area improve in appearance each time you do this. You might also like to try the layer mask trick described in the sidebar.

Adaptation methods



If you choose the patch tool method you have more control over the content-aware fill calculations. The main advantage you have when using the patch tool is that when you drag a patch selection you have some control as to which areas you would wish the content-aware fill to sample from. This can make a big difference to the final outcome.

The other thing you have control over is the adaptation method that you would prefer to use. In Step 3 on the previous page I dragged the patch tool selection to the left to indicate the area I would like the tool to sample from. After letting go with the mouse, Photoshop carried out the content-aware fill. I was then able to select different adaptation methods to see which worked best here. Note that while you can set the adaptation method first before you use the patch tool, you can also edit this after dragging the patch tool selection and review the effect this has on a content-aware fill. With the Strict method, Photoshop uses a rigid sampling from the surrounding area, while with the Loose method it tends to jumble things up more. The default setting is 'Medium', which is probably a good starting-point to work with. In the previous example though, I found that the Very Loose setting happened to produce the best-looking result.

Training the content-aware fill

To improve the effectiveness of a content-aware fill you can use a layer mask to hide areas of an image that you would rather the content-aware fill ignored when filling a selection. For example, if you start with a Background layer, double-click to convert this to a regular layer and add an empty layer mask to that layer. Then with black as the foreground color, paint with black to hide the bits you don't want the content-aware fill to pick up. Now make a regular selection and apply the content-aware fill. When you are done you can delete the layer mask to reveal the entire layer again.

Delete options

If you make a selection on a background layer, or a flattened image and hit Delete, you'll see a Fill dialog box pop up. This allows you to choose how you wish to fill the selected areas and will have Content-Aware Fill selected by default. In the past, hitting Delete with a Background layer selected would fill the selected region using the current background color. If you want to bypass this behavior, you can use  Delete  Delete to fill using the background color.

Content-aware fill and Puppet Warp

I imagine some people will want to use the Puppet Warp feature (described in the following chapter) to select an object and manipulate it directly. I therefore think the content-aware fill feature may prove very useful as a preparation step where you would select an object and copy it to a new layer and then use the same selection to apply a Content-aware fill to the original background layer.

Adobe™ Photoshop™ CS6 for Photographers

This PDF is supplied on the website that accompanies the *Adobe Photoshop CS6 for Photographers* book by Martin Evening. This latest update in the Adobe Photoshop for Photographers series contains 768 pages in full color, plus a website containing video tutorials. The book contains updated advice on everything you need to know about using Photoshop, from digital capture to print output, as well as all that is new in Adobe Photoshop CS6.

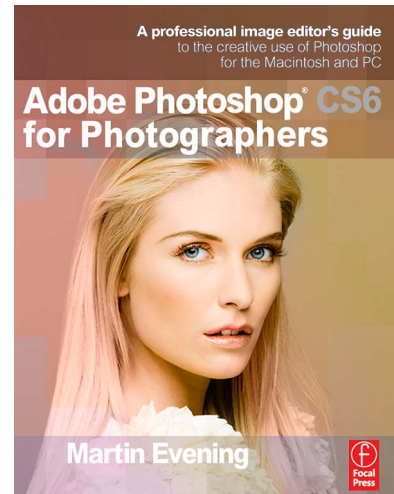
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