

# Highlight Recovery in Camera Raw

A little-known capability of the Adobe® Camera Raw plug-in is highlight recovery in the nearly overexposed highlights of a raw digital capture. Normally, when one or two of the channels in an image are clipped—pinned to 255—raw processors stop trying to use any of the data on the unclipped channels. This means that with most raw processors, the first clipped channel limits the highlights of an image. Even if there is usable data in one or two channels, the raw processors just stop trying to get anything usable.

Camera Raw doesn't limit the highlights of an image. Anytime you set the Exposure settings to a minus number, even a -.05 setting, Camera Raw attempts to return useful data. Depending on the camera and the extent of the raw highlight data, Camera Raw can provide additional usable data down to a -1.00 to -2.00 range and sometimes even more. Because the data is from only one or two channels, Camera Raw returns the image data as luminance information. But this can still substantially extend the useful range of a raw capture. Whenever the original scene has a high luminance range—perhaps beyond the dynamic range of the camera sensor—highlight recovery in Camera Raw can help extend the range of a processed image. By adjusting the Exposure down and the Brightness up, you can maintain highlight detail that would be lost with other raw processors.

***Note:** Highlight recovery in Camera Raw 2.0 (the version of Camera Raw that originally shipped with Adobe Photoshop® CS) had some issues with some cameras when trying to recover luminance data beyond the first clipped channel. Version 2.2 and later of the plug-in fixes these issues to help eliminate odd color at extreme highlight areas. Camera Raw updates are available from [www.adobe.com/products/photoshop/cameraraw.html](http://www.adobe.com/products/photoshop/cameraraw.html) as free downloads.*

To extend the range even further, it's often useful to process the raw image twice—once optimized for the overall tone of the image and once specially for the highlights. Blending these two processed versions is simple in Photoshop CS by using a layer mask and adjusting the opacity of the dark processed image.

The camera settings for the following image are set to Camera Default. The overall exposure is fairly good, but the shadows are too dark. The histogram shows that the majority of the data is in the shadows.

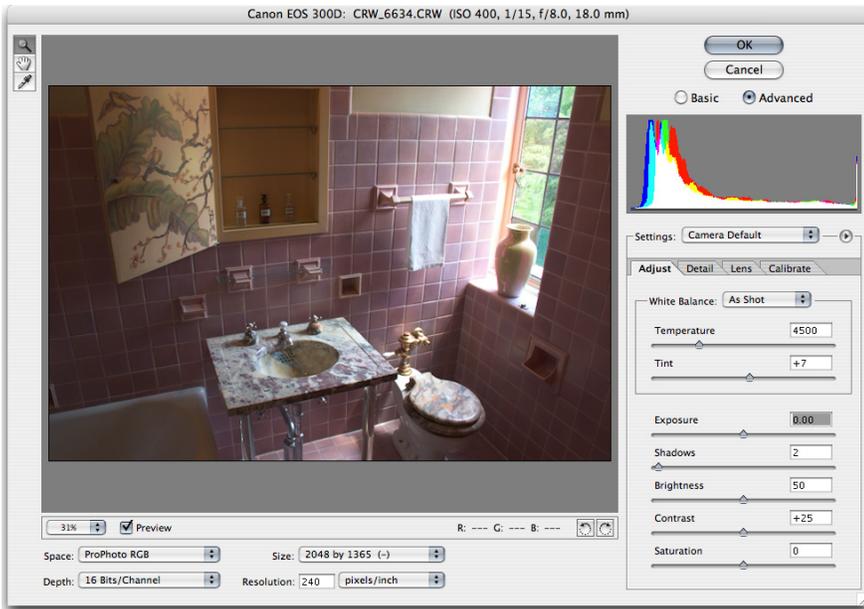


Image with Camera Default settings

If you want to bring out more detail in the shadows, you will have to increase the Brightness, and possibly the Exposure. In the following image, the Exposure setting has been adjusted to +.30 and the Brightness to 100. This lightens the overall density of the image but makes the highlights too bright.

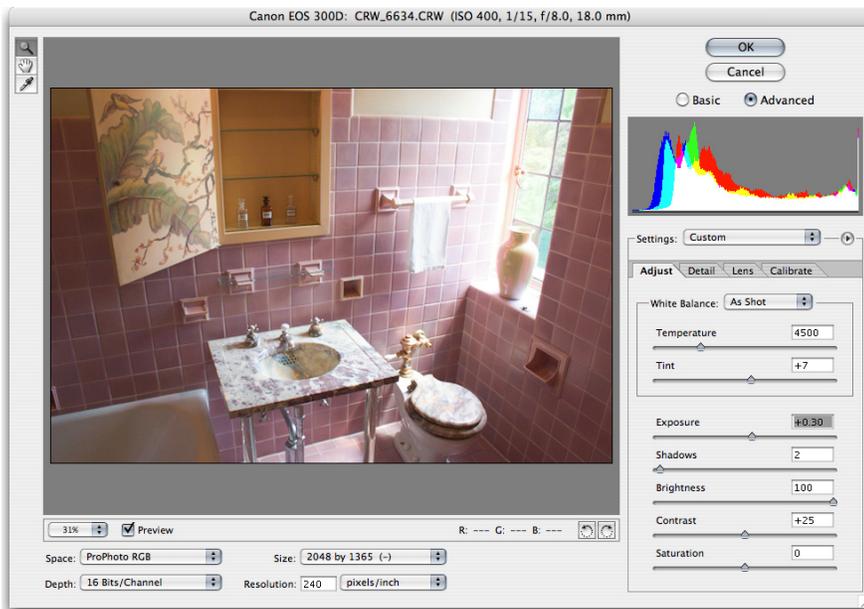
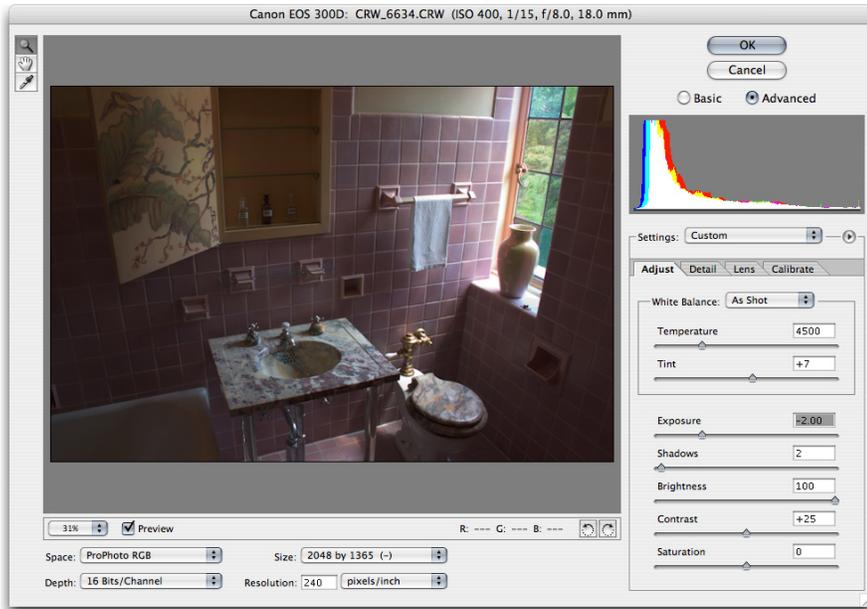


Image with Exposure and Brightness settings that are higher than the Default settings

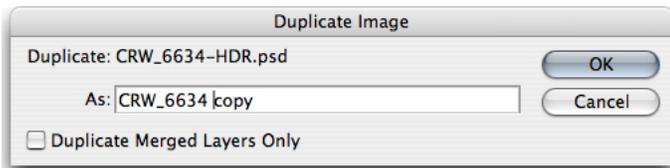
This image provides a great example of how blending two conversions of the same image together can help bring out a much wider range of highlight and shadow detail, than you could from using one conversion.

Start by setting the Exposure and Brightness to render good detail in the highlights of your image, while letting the midtones and shadows go dark. In the following example, the Exposure setting has been adjusted to -2.00. Not only does this setting reduce the density of the extreme highlights, but it also brings in the highlight recovery capabilities of Camera Raw. Notice how much more highlight detail appears in the tiles and vase around the window. Click OK to process the image using these settings.



Adjusting the Exposure setting too low activates highlight recovery.

Now you are ready to process the image a second time for the shadows and midtones of the image. But, there is a catch when you process an image through Camera Raw twice. Because you've already processed the image once and it's open in Photoshop, you can't go back to the original raw image to open it a second time. To work around this issue, just duplicate the first instance then and close original.



Duplicating an image

Once you duplicate the first processed image and close the original, you can go back to the raw file and process it again by using new settings.

This time process the image for detail in the shadows and midtones. Note that the highlights have become washed out. (This is OK for now.)



Image with settings adjusted for overall tone

Once you have both images open, simply use the Move tool to drag the darker image into the lighter image as a layer. After starting to drag, hold down the Shift key to layer the two images together perfectly in pin register. The result is shown below.

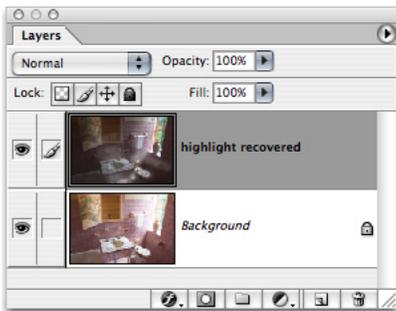
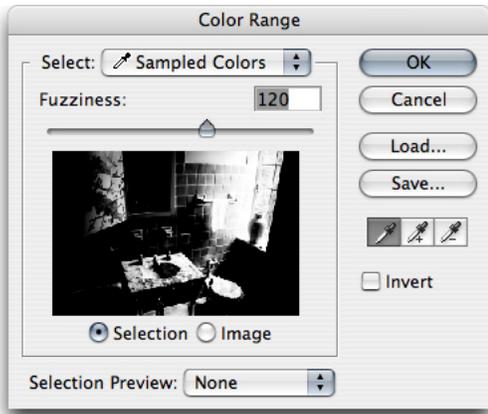


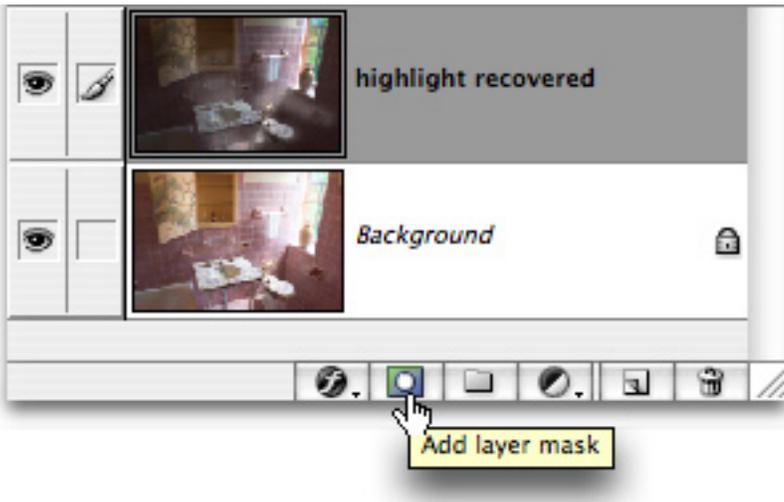
Image in two layers

An easy way to employ the darker exposure is to create a layer mask to use only the highlights of the darker image. By using Color Range with white as the selected color and a wide Fuzziness setting, you can make a selection based on just the highlights.



Using the highlights of the darker layer

Once you have the active selection, create a layer mask on the dark processed image. An easy way is to click the Add Layer Mask icon at the bottom of the layer palette.



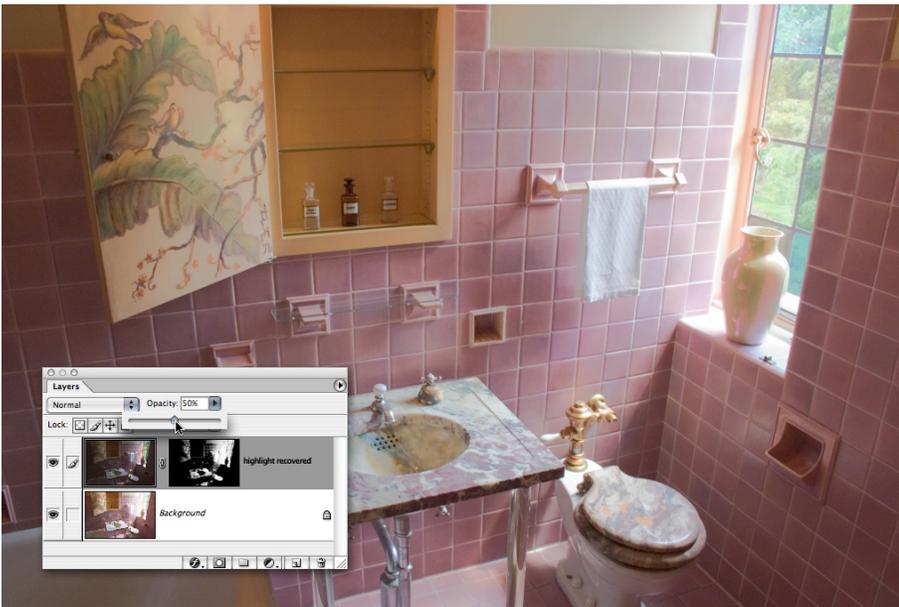
Creating a layer mask by clicking the Add Layer Mask icon

Don't be overly concerned if your image looks odd after you have the mask in place. The following image shows what the masked image looks like layered over a normal processed layer. The image looks artificially reduced in contrast.



Two layers blended into a single image

By adjusting the opacity of the top layer, you can adjust how much of the darkened highlights show through. In the following image, the opacity of the top layer has been reduced to 50%. This reduces the impact of the dark processed layer and makes the overall contrast more realistic.



Reducing the opacity of the top layer to improve overall contrast

To further refine where the top layer shows through, you can paint with black on the layer mask to hide additional areas beyond what you selected by using Color Range. Painting with white allows more of the dark highlight layer to show through.

In the following image, certain areas, such as the top of the sink and the cabinet door, have been painted over by black to preserve their original luminosity. The area above the towel rack has also been toned down a bit to reduce the darkening of that area.



Darkness reduced in specific areas

By adjusting the overall opacity and the local opacity through the layer mask, you can literally paint with light and dark to locally finesse the contrast of your image.

The scene luminance of the following combination of two processed images has a much better balance between the darker and lighter areas of the scene. This also shows just how much dynamic range today's camera sensors are capable of. Using the Exposure controls in Camera Raw—particularly the highlight recovery capabilities—enables you to gather as much usable image data as possible.



Well-balanced two-layer image



Detail of the image before adding the highlight recovery combination



**Jeff Schewe**

Jeff, a summa cum laude graduate of Rochester Institute of Technology, has been an advertising photographer in Chicago for over 25 years. He has been doing digital imaging for over 14 years and is widely known and respected in the digital imaging community as a leading pioneer in the field. Jeff is a feature consultant and alpha tester for Adobe Photoshop.



Detail of the image after adding the highlight recovery combination

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