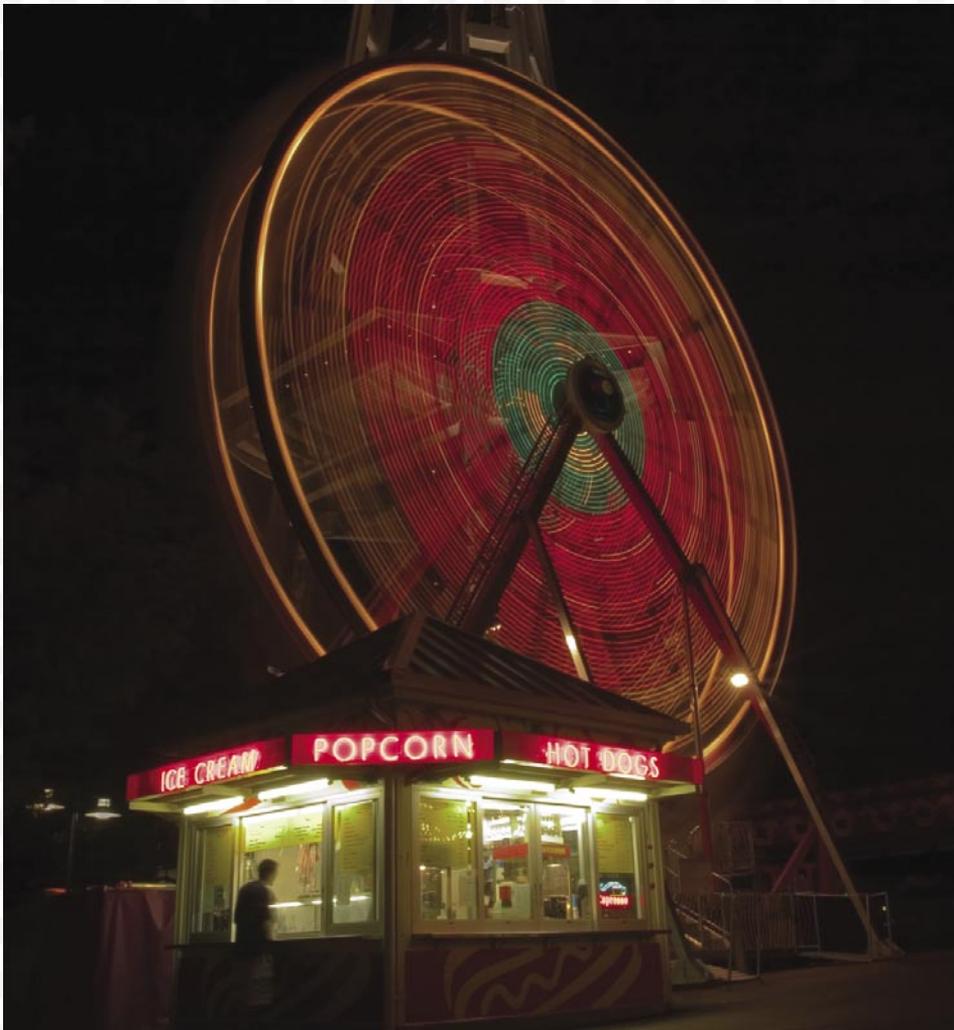


CHAPTER

10

Using Camera Raw



There is a building. Inside this building there is a level where no elevator can go, and no stair can reach. This level is filled with doors. These doors lead to many places. Hidden places. But one door is special. One door leads to the source.

—The Keymaker, *The Matrix Reloaded*

Using Camera Raw



For the digital camera crowd, the Camera Raw feature is a substantial and welcome addition to Photoshop CS. If your camera can shoot in the RAW file format, do not pass Go, drop everything, and read this chapter immediately.

If you work with images from high-end digital cameras, then you might want to consider shooting in RAW file format (not all cameras offer RAW format). RAW files are different from JPEG or TIFF images in that they contain all the data that was captured from the camera with minimal processing.

Your digital camera has to do quite a bit of processing in order to turn the raw data from your camera into a JPEG or TIFF file (white balance, gamma, color profile, interpolation, sharpening, saturation, and other adjustments). You can think of a RAW file as the pure unadulterated data that came from the camera's sensor. Most programs can't open RAW images directly, but Photoshop CS can. (Actually, Camera Raw used to be a plug-in you could buy separately from Photoshop, but now Adobe has updated it and included it with Photoshop.) When you shoot RAW files, you don't have to worry about the white balance setting on your camera because you can specify that setting when opening the image in Photoshop.



Some digital cameras (like the Canon 1D and 1Ds) save the raw camera data as part of a TIFF file. They save a 300×200 pixel preview of the image that can be read by any program that can handle a TIFF file. Inside that TIFF file, however, is the full resolution raw data from the camera, which is ignored by most programs that handle TIFF files. If you happen to have one of those cameras, then be very careful who you let work on your files. If someone opens one of those TIFF files in a program that isn't designed to deal with raw format images, then they will only see the 300×200 pixel preview image. They could then easily resave the file, which will completely overwrite the raw data that was originally in the file, leaving you with an image that contains only 300×200 pixels.

When you attempt to open a RAW format image in Photoshop, you will be presented with the Camera Raw dialog box (**Figure 10.1**). This is where you can adjust everything from the overall color of the image to the brightness and contrast, as well as control how much sharpening will be applied.

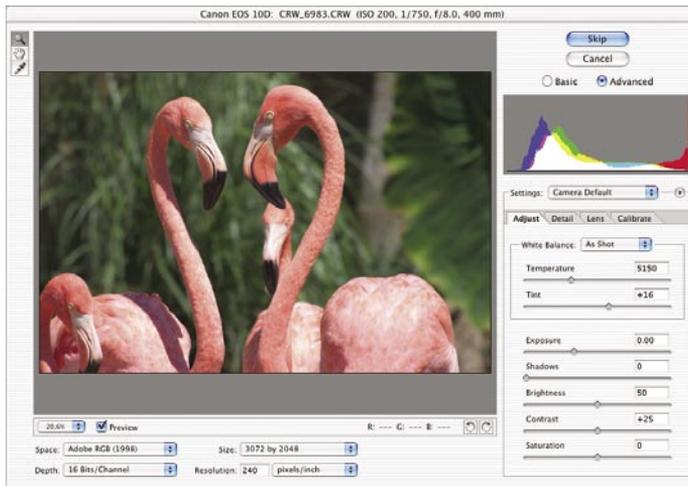


Figure 10.1 The Camera Raw dialog box. (©2003 Ben Willmore)



Photoshop's RAW format isn't the same as Camera Raw format. The names sound almost identical, but Camera Raw files can only originate from a digital camera, and Photoshop cannot change the file at all. Camera Raw files are locked because they are designed to contain only the information that came from your digital camera; therefore, they cannot be directly modified after the photo is taken. Think of it like the files on a CD. You can open them, but you can't save back to the CD because it's locked. That doesn't limit at all what you can do to the images; it just means that you have to save the changes to your local hard drive instead of the CD. With Camera Raw files, it means that changes have to be saved in a different file format (like TIFF, Photoshop, or JPG). Photoshop's RAW file format, on the other hand, is mainly used to export images so they can be imported into unusual software that can't handle common file formats (it's something I doubt you'll ever have to use).

The Camera Raw Dialog Box

Let's start with a brief overview of the layout of the Camera Raw dialog box, and then we'll dive deeper and look at each specific setting.

In the upper left of the dialog box, you'll find the familiar Zoom and Hand tools, along with an Eyedropper tool that works much like the middle eyedropper that is found in both the Levels and Curves dialog box (we covered them in Chapter 9, "Color Correction"). We'll talk more about the Eyedropper tool when we start talking about the features that appear on the right side of the Camera Raw dialog box. When you're navigating your image, you should know the following keyboard shortcuts: Typing Command-Minus (Mac) or Ctrl-Minus (Windows) will zoom out from your image. Typing Command-Plus (Mac) or Ctrl-Plus (Windows) will zoom in on your image. Holding the spacebar will temporarily make the Hand tool active.

Across the bottom of the dialog box you'll find settings that don't change the general appearance of the image, but instead control its size and other attributes that tell Photoshop how to treat the image when it's opened. This is also where you can zoom in or out on your image, rotate it, and preview the changes you've made with all those sliders that show up on the right side of the dialog box.

In the upper right of the dialog box, you'll find a histogram that shows you how the sliders are affecting the overall tonality of the image. If you're not familiar with histograms, be sure to look back at Chapter 6, "Optimizing Grayscale Images," and Chapter 7, "Understanding Curves," for more information.

Below the histogram, you'll find a dazzling array of sliders organized into tabs of different categories (Adjust, Detail, Lens, and Calibrate), each with its own set of controls. This is where you can radically change the appearance of your image and optimize it before you open it in Photoshop.

Let's look at these settings one at a time. I'll describe them in the same order in which I usually adjust my own images.

The Adjust Tab

The Adjust tab should be your mandatory first stop in the Camera Raw dialog box. I use it for every image I ever open with Camera Raw (**Figure 10.2**); all the other settings under the other tabs can be considered optional. The Adjust tab is where we can change the overall color feeling of the image, adjust the brightness and contrast, and make sure we retain as much detail as possible. I like to start with the White Balance settings.

White Balance

This setting allows you to shift the overall color of your image, making it feel warm, cool, or neutral. There are three ways to set the white balance of your image: the pop-up menu, the sliders, or the Eyedropper tool.

The majority of the time, I end up using the White Balance pop-up menu because it's simple and easy. That's where you'll find presets for different types of lighting conditions (Daylight, Cloudy, Tungsten, Fluorescent). If you know which type of light an image was shot under, then choose that preset so Photoshop will correct for that particular light source. If you're not sure what the lighting conditions were when the image was shot, then just click through them and watch your image change until you find the one that makes the colors in your image look their best (**Figures 10.3** and **10.4**). Or, if you're in a big hurry, just set the menu to Auto and Photoshop will use the setting that it thinks is appropriate for the lighting conditions of your image. All this pop-up menu is doing is moving the Temperature and Tint sliders to preset positions. But before you start fiddling with those sliders, I'd recommend beginning with the pop-up menu because that will easily get you to a good starting point, which you can then fine-tune with the sliders.

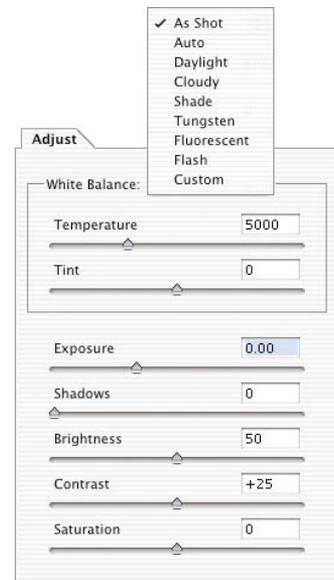


Figure 10.2 The settings found under the Adjust tab.



Daylight

Figure 10.3 Result of using the Daylight White Balance setting on an image captured under daylight lighting conditions. (©2003 Ben Willmore)



Tungsten

Figure 10.4 Result of using the Tungsten White Balance setting on an image captured under daylight lighting conditions. (©2003 Ben Willmore)

Moving the Temperature slider toward the left will shift the colors in your image toward blue; sliding it to the right will shift them toward yellow. The Tint slider will shift the color in your image toward green or magenta. The combination of these two sliders will allow you to shift the image toward just about any color you can think of. For instance, if you move both the Temperature and Tint sliders toward the right, you'll be simultaneously shifting the image toward yellow and magenta. Those two colors combined produce red, so that's the color your image will shift toward. Moving them in the opposite direction would shift things toward both blue and green, which will send the colors toward cyan.

If you want your image to look completely neutral (not warm or cool feeling), you might consider using the Eyedropper tool that is located in the upper left of the Camera Raw dialog box. With that tool active, you can click on your image and Photoshop will figure out the proper Temperature and Tint settings that would be needed to remove all the color from the area you clicked on. All you have to do is find an area that shouldn't contain color and then click on it (**Figures 10.5** and **10.6**). Just look for anything that appears to be a shade of gray in the image. It could be someone's gray sweatshirt, a wall that's painted white, a button on someone's shirt, or anything else that shouldn't contain a trace of color. Then, if you feel the image is just too sterile looking, you're welcome to adjust the Temperature and Tint sliders to make the image a little warmer (toward yellow and magenta) or cooler (toward green and blue).



Figure 10.5 Image opened with random Temperature and Tint settings. (©2003 Ben Willmore)



Figure 10.6 Image opened by clicking with the Eyedropper tool on an area that should not contain color. (©2003 Ben Willmore)

There isn't always an ideal White Balance setting for each image. Your personal interpretation of what you'd like your image to look like will determine the setting you use. I often use these settings to manipulate the color of my images.

NOTES

Depending on how much you've zoomed in, the Eyedropper will look at different numbers of pixels in your image. If you view your image at 100%, it will look at the exact pixel that is under your cursor when you click the mouse button. Viewing your image at 50% will make the Eyedropper look at a 2×2 pixel area of your image. I find that I like the results better when I'm viewing my image at 25% or 50%, because I don't have to worry about clicking on an odd-colored pixel that would get averaged into the colors that are surrounding it.

Let's say I took a photo under the midday sun, but I really wish I could have been at that location during sunrise or sunset so I would have ended up with a very warm-looking image. Well, all I have to do is experiment with the Temperature and Tint sliders, and I'll be able to manipulate the overall feeling of the image. It doesn't really matter which of the three methods you use (pop-up menu, sliders, or Eyedropper) because in the end, all of them are just manipulating the Temperature and Tint sliders to produce the end result you see.

Exposure Slider

The Exposure slider will control the brightness of the brightest area of your image. It's a lot like the upper-right slider in the Levels dialog box (we talked about that one back in Chapter 6). As you move the Exposure slider farther to the right, more areas of your image become pure white. Because of that, you have to be very careful; otherwise, you'll end up trashing the detail in the brightest part of your image. Go ahead, open a RAW image (if you don't have one, I put one on the CD for you in Chapter 10 in the Practice Images folder) and move the Exposure slider around. Be sure to move it all the way to the left and right to see how radical of a change you can make (**Figures 10.7** through **10.9**). It's not very often that I would adjust this slider by eye; I'd much prefer to use a hidden feature that will make it much easier to tell if I'm trashing too much detail.



Figure 10.7 Result of moving the Exposure slider all the way to the left. (©2003 Ben Willmore)



Figure 10.8 Result of leaving the Exposure slider at its default setting.



Figure 10.9 Result of moving the Exposure slider all the way to the right.

If you hold down the Option key (Mac) or Alt key (Windows) while you move the Exposure slider, Photoshop will change the way it displays your image (**Figure 10.10**). It will show you any areas that have the potential of losing detail (known as a clipping display). You don't have to worry about the areas that appear solid black because those areas should still have detail. But when an area shows up as solid white, then it has absolutely no detail and will end up solid white when the image is opened in Photoshop. If, on the other hand, you start seeing different colors showing up, that means that you're starting to get less detail in those areas, but you haven't blown them out to pure white quite yet. Rather, it means that you've maxed out one or more of the red, green, and blue colors that make up your image—max out all three and you'll end up with white.



Figure 10.10 If you hold the Option/Alt key when dragging the Exposure slider, you'll get a clipping display.

My approach to adjusting this slider is to move it toward the right (with Option/Alt held down) until I see the first hints of white showing up (**Figure 10.11**). Then I'll back off a tiny amount and think of that as the farthest I'd want to move it (**Figure 10.12**) (unless I have a photo of something that should have huge areas of pure white, like text on a white background). Then I'll look at the colored areas that are showing up, and if there are areas that contain critical detail, I'll continue to move the slider back toward



Figure 10.11 Hold Option/Alt and drag the Exposure slider until you see the first hints of white.



Figure 10.12 Back off on the Exposure setting until you don't see any white.

the left until I see only small areas of color. I don't mind having large areas of color if I want my image to look really saturated, because you have to max out at least one of the colors that make up your image (red, green, and blue) in order to get a truly saturated color. Once I've found the general range that I like, I'll let go of the Option/Alt key and see how this setting is affecting the brightest areas of my image, and then fine-tune it if necessary. The vast majority of the time I end up leaving it at the position that was just shy of seeing solid white when I had the Option/Alt key held down. The one exception to that rule is when your image contains direct reflections of light on a shiny object (such as water, glass, or metal). In that case, your image will usually look better if those bright reflections don't have any detail and are blown out to pure white.

If for some reason you decide not to use the clipping display (by holding Option or Alt while dragging the slider), then be sure to keep an eye on the histogram that appears at the top right of the Camera Raw dialog box (**Figure 10.13**). Detail is made out of a combination of red, green, and blue, and the height and color of the spikes on the end of the histogram will tell you how much detail is being lost. If you see a spike on the right end of the histogram, then you might be losing detail in the brightest area of your image. If the spike is white, then you're starting to get larger areas of solid white. If, on the other hand, the spike is a color (like red, green, or blue), then you haven't lost all the detail in your highlights, but you're starting to have less than what you started with.

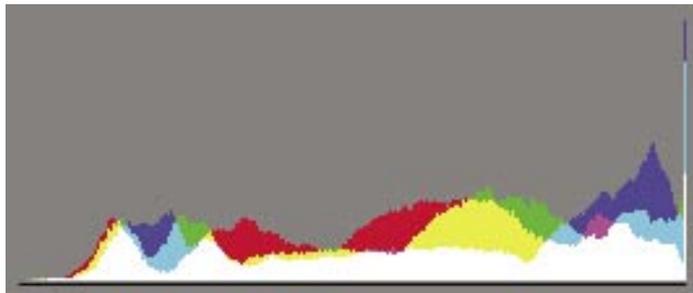


Figure 10.13 If you're not using the clipping display, be sure to keep an eye on the histogram.

The Exposure setting is only used to control how bright the absolute brightest areas of your image should be. I don't suggest you try to control the overall brightness of your image with this slider. There are better ways to do that, which we'll get to in a few moments. Right now, let's think about the darker areas of your image.

Shadows Slider

The Shadows slider controls how dark the absolute darkest areas of your image will be. It's very similar to the upper-left slider in the Levels dialog box (which we talked about in Chapter 6). It works just like the Exposure slider in that you can hold Option or Alt to see which areas are becoming solid black (they will look black), which areas are starting to have less detail (colored areas), and which areas haven't lost any detail (they will look white). You can move the Shadows slider until you see the first hints of pure black showing up and then back off just slightly so you don't trash the detail anywhere (**Figure 10.14**).

If you decide not to use the clipping display feature when moving the Shadows slider, be sure to keep an eye on the histogram at the top of the dialog box. Again, acting just like the Exposure slider, but working with shadows instead of bright areas, a spike on the far left of the histogram is an indication that you might be losing detail in the shadows of your image. If the spike is white instead of a color, then you're starting to get some solid black areas in your image.



Figure 10.14 When moving the Shadows slider, try not to force any areas to black.

Brightness Slider

Now that we've determined how bright the brightest areas should be and how dark the darkest areas should be, it's time to adjust the brightness levels that fall between black and white.

The Brightness slider is very similar to the middle slider in the Levels dialog box because it attempts to adjust the overall brightness of your image without screwing up the brightest or darkest areas. Move the slider to the left if your image needs to be darker (**Figures 10.15** and **10.16**), or move it to the right to brighten the image (**Figure 10.17**). If you're planning to make radical changes in brightness, I recommend that you use curves (see Chapter 7) after you've opened the image in Photoshop. You'll simply have a lot more control over the process that way, but it won't hurt if you make a slight tweak using the Brightness slider.



Figure 10.15 Image opened using default Brightness setting of 50. (©2003 Ben Willmore)



Figure 10.16 Result of moving the Brightness slider all the way to the left to darken the image.



Figure 10.17 Result of moving the Brightness slider all the way to the right to brighten the image.

The clipping display is not available when moving the Brightness slider, so be sure to keep an eye on the histogram to see if you're losing detail in the highlights or shadows. Look for spikes developing on the ends of the histogram. If you see one on the left side, then either move the brightness slider toward the right to brighten the image or readjust the Shadows slider until the spike has been minimized—assuming you don't want to lose detail in the darkest areas of your image. If the spike is on the right end of the histogram, then either move the Brightness slider toward the left to darken the image or readjust the Exposure slider to see if you can reduce or eliminate the spike. Remember that white spikes mean no detail whatsoever

(solid black or white), whereas colored spikes indicate that you're getting close to losing all detail in an area, but you still have a hint of detail left. My personal preference is to go back and readjust the Exposure or Shadows slider when I get a spike instead of backing off on the Brightness adjustment; otherwise, I might end up with an overly bright or dark image—it's only the brightest and darkest areas that would lose detail, so why not go back to the settings that specifically control those areas?

Contrast Slider

I consider the Contrast slider to be optional. Most of the time, I'd rather adjust the contrast of my images using curves because they provide much more control than I'd ever get by moving a generic Contrast slider. But, when I'm in a hurry, I often limit my adjustments to what's available in the Camera Raw dialog box. For instance, when I do a photo shoot, I often want to email my girlfriend just to show her a few of the shots I took. That's when I don't want to spend too much time adjusting individual images, so I'll settle for the generic Contrast adjustment instead of spending the time it would take to fine-tune it with curves (Figures 10.18 through 10.20).



The main reason that the Contrast slider is available is so that you can quickly adjust your image when applying an action, and so you can include the entire adjustment as a single step in the action.

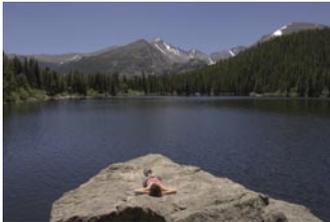


Figure 10.18 Image opened with -40 contrast setting.
(©2003 Ben Willmore)

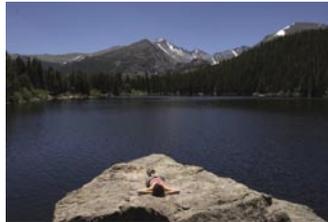


Figure 10.19 Image opened with default contrast setting of $+25$.

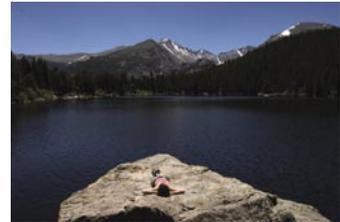


Figure 10.20 Image opened with $+70$ contrast setting.

The Contrast slider can also cause detail loss in the highlights and/or shadow areas of your image, but it's not as easy to screw up your image as it is with the Exposure, Shadows, and Brightness sliders. If you're really cranking up the contrast, you might want to glance at the histogram to see if you're blowing out the detail in the shadows or highlights (remember, spikes on the end equals clipping).

Saturation Slider

I think of the Saturation slider as optional. The truth is, you'll have much more control over your image if you adjust it in Photoshop with the Hue/Saturation dialog box. But, if you're in a hurry, or if you're recording an action that will be applied to a large number of similar images, then you might decide to use this slider instead of taking the time to do it as two steps. If you have more time, you can test the waters with this slider, and make the actual adjustments with the Hue/Saturation dialog box afterward (Figures 10.21 through 10.23).



Figure 10.21 Image opened with -50 Saturation setting. (©2003 Ben Willmore)



Figure 10.22 Image opened with 0 Saturation setting.



Figure 10.23 Image opened with +50 Saturation setting.

If you want a better idea of how the White Balance setting is affecting the colors of your image, you can temporarily pump up the saturation of your image with this slider. Then, once you like the overall color of the image, bring the Saturation slider back to zero, so you can instead adjust saturation in Photoshop.

Don't feel bad if you decide to use the Contrast or Saturation sliders. There's nothing wrong with them. You'll just have much more control if you use curves to adjust the contrast and Hue/Saturation to adjust the saturation. So, if you ever get frustrated with these two somewhat crude controls, be sure to check out Chapter 7, "Understanding Curves" and Chapter 11, "Color Manipulation."

Now let's move on and explore the settings found under the other tabs that appear on the right side of the Camera Raw dialog box. Those are the ones that I consider to be optional because not every image will benefit from those features, and you can often get more control if you use similar settings after your image is opened in Photoshop.

The Detail Tab

Digital cameras often produce images that look a bit soft and can often contain tiny specks of noise that can be distracting. The Detail tab is where you can deal with these problems, and hopefully produce a sharp and noise-free image. These settings make rather subtle changes to your image, so it's best to work with them when you're viewing your image at 100% magnification.

Sharpness

I must confess that I almost never use the Sharpness slider because I prefer to sharpen my image as the final step right before I print. It's ideal if you sharpen an image after it has been scaled down to its final size, and the Unsharp Mask filter gives you much more control because it has three sliders to control sharpening instead of just one. But whatever you do, don't ignore this setting because the default sharpness amount is 25, not 0.

But, again, if you're in a hurry, recording an action, or feeling just plain lazy, there are merits to the Sharpness slider. You might find that moving the slider doesn't appear to do anything to your image. That usually happens when you're zoomed out so you can see the entire image. Before you start to sharpen your image, double-click on the Zoom tool in the upper left of the Camera Raw dialog box. That will get you to 100% view, where you'll be able to see exactly what the Sharpness slider is doing to your image. When you're done, you can always double-click on the Hand tool to get back to the view that shows your entire image. I won't say much about sharpening here because there is an entire chapter (Chapter 14, "Sharpening") dedicated to the subject later in this book.



If you plan to sharpen your images in Photoshop, then choose Preferences from the side menu that appears just above and to the right of the Detail tab and change the Apply Sharpening Settings to Pop-up Menu to Preview Images Only. When you do that, the Sharpness setting will apply only to the onscreen image preview, and no sharpening will be applied when you open the image in Photoshop.

Luminance Smoothing

Luminance Smoothing is designed to reduce the noise that shows up when you use high ISO settings with your digital camera (**Figure 10.24**). It won't deal with those colorful specks you see on occasion (that's what Color Noise Reduction is for), but it should be able to handle the dark specks that you get when you try to brighten up an image that was shot in low lighting conditions. All you need to do is zoom in to 100% view (double-click on the Zoom tool to get there), and then experiment with the slider until the noise is minimized (**Figure 10.25**). Just be sure to look at the fine detail in your image to make sure it hasn't removed important detail like freckles or skin texture.



Figure 10.24 Zooming in on this image reveals bright specks.



Figure 10.25 The specks are less obvious after adjusting the Luminance Smoothing setting.

Color Noise Reduction

The Color Noise Reduction slider will attempt to blend in any colorful specks that appear on your image (**Figure 10.26**) by making them look similar to the colors that surround them (**Figure 10.27**). These colorful specks are often the result of shooting with high ISO settings on your digital camera. Just like with Luminance Smoothing, you'll want to be at 100% view and move the slider just high enough to blend the multicolored specks into your image.

You have to be careful with the Luminance Smoothing and Color Noise Reduction sliders because they will both soften your image. Be sure to toggle the Preview check box at the bottom of your image off and on to make sure it's worth applying these settings. Sometimes it's better to have a noisy image that still has detail and sharpness than one with no noise that looks overly soft. Also, remember that you can always sharpen your image after you open it in Photoshop, which means that it doesn't have to remain as soft as it might appear after you apply smoothing and noise reduction.

Now that you know how to adjust your image and minimize noise, let's start to explore some of the more obscure features of Camera Raw. There are two more tabs that are available in Camera Raw, but you have to choose Advanced in the upper right of the dialog box for them to appear. Adobe divided the features in Camera Raw into basic and advanced just to keep clutter down and to try to minimize intimidating new users.

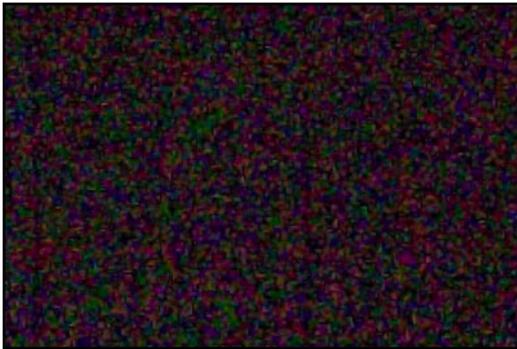


Figure 10.26 With the Color Noise Reduction setting at zero, you can see specks of many different colors.



Figure 10.27 After adjusting the Color Noise Reduction slider, the colorful specks blend into the surrounding colors.



Figure 10.28 The sliders found under the Lens tab are designed to compensate for problems related to the camera lens.

The Lens Tab

This is another collection of settings that are completely optional (**Figure 10.28**). I use them only when I notice specific problems with my images that have to do with the lens that I used to shoot them.

Some lenses—particularly wide-angle lenses—often have the problem of focusing different wavelengths of light at different points. When that happens, you can end up with a halo of color on the edge of objects that would usually be white or black (and to a lesser extent colored objects). I'm no expert on optics, but I've been told that this particular problem is called *chromatic aberration*. I just think of it as messed up color on the outer portions of images taken with wide-angle lenses, because that's where I've run into it. The higher the contrast between objects, the more obvious it will be.

If you notice a halo of red on one side of an object and cyan on the opposite side, try moving the Chromatic Aberration R/C (for Red/Cyan) slider back and forth to see if you can reduce the halos (**Figures 10.29** through **10.31**). If, on the other hand, you see blue and yellow halos, then adjust the Chromatic Aberration B/Y slider instead. You might need to adjust both of the sliders depending on exactly what colors you're seeing on the edges of objects. Because these sliders are performing a very simple operation—scaling the colors that make up your image—they can't always get rid of this type of problem.

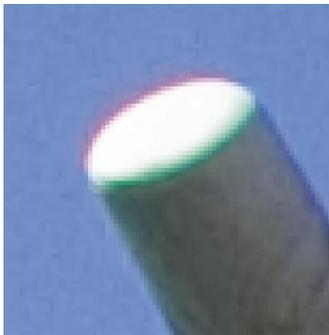


Figure 10.29 Original image. (Courtesy of Tim Whitehouse)

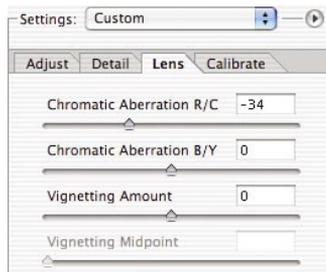


Figure 10.30 The Chromatic Aberration settings used to correct the image shown in Figure 10.29.

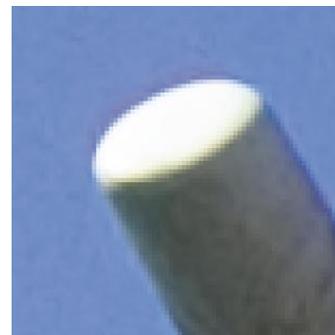


Figure 10.31 After adjusting the Chromatic Aberration settings, the color halos are no longer obvious.

The two Vignetting sliders are designed to compensate for light falloff on the edge of your image. *Vignetting* is a term the photography folks like to throw around that generally refers to lighter centers with darker edges. So, if you ever notice that the outer edges of your image are darker than the middle, then move the Vignetting Amount slider toward the right until the brightness of the edge looks more like the middle of your image. Once you've done that, you'll need to adjust the Vignetting Midpoint setting to control how far the brightening effect of the last slider encroaches on the center of your image. Just move it until the formerly dark edges blend into the rest of the image.

You can also use these sliders to add vignetting to your image (**Figures 10.32** and **10.33**), which will effectively darken the corners and edges of the image. Photographers often like that effect because it draws the viewer's attention toward the center of the image. I like to do that in combination with lowering the Saturation and Contrast sliders under the Adjust tab to simulate the look of an old faded photo (**Figure 10.34**).



Figure 10.32 Original image. (©2003 Ben Willmore)



Figure 10.33 Moving the Vignetting slider all the way to the left darkened the corners of the image.



Figure 10.34 Lowering the Contrast and Saturation settings helps the image look more like an old faded photo.



Figure 10.35 The settings found under the Calibrate tab allow you to change how Photoshop interprets the colors in your image.

The next section of Camera Raw is one that I would reserve for advanced users. So, if you're a Photoshop newbie, you might want to skip over this next section and pick things back up when I start talking about the workflow settings.

The Calibrate Tab

You have to choose Advanced at the top of the Camera Raw dialog box in order to access the Calibrate tab; this is the same place you found the Lens tab. The sliders under the Calibrate tab (**Figure 10.35**) allow you to change the way Photoshop interprets the color information that your camera delivers to Photoshop. You can use these settings to simulate different film types and to compensate for problems that come along with certain digital cameras.

You might find that certain models of digital cameras produce images that have an annoying colorcast in the darkest areas of your image (**Figure 10.36**). If you have one of those cameras, then just about every image you open will have a cast in the shadows of the image. The Shadow Tint slider will allow you to shift the color of the darkest areas of your image toward green or magenta (**Figure 10.37**).



Figure 10.36 Original image. (©2003 Ben Willmore)



Figure 10.37 Result of adjusting the Shadow Tint slider.

Finally, if you find that you're simply not happy with the color that you get from your digital camera, you might want to experiment with the Red, Green, and Blue Hue and Saturation sliders. These sliders can also be used to simulate different traditional film types (**Figures 10.38** and **10.39**). For instance, Fuji Velvia film delivers higher-contrast images with saturated colors, whereas Kodak Porta is fine-tuned to produce good-looking skin tones.



Figure 10.38 Original image.



Figure 10.39 Result of experimenting with the RGB settings.

The red, green, and blue sliders will not change areas that are neutral gray. The red sliders will mainly affect the appearance of reds in your image, and will affect yellow and magenta areas to a lesser extent. The green sliders will mainly affect the appearance of greens in your image, and will affect cyan and yellow areas to a lesser extent. The blue sliders will mainly affect the appearance of blues in your image, and will affect magenta and cyan areas to a lesser extent.

I'd suggest that you first choose Camera Default from the pop-up menu above the Calibrate tab before you start messing with the Calibrate settings. That way, you can make sure that the changes you see on your image are solely caused by the Calibrate settings. Just move the sliders around while you watch your image—you can easily replace experience with experimentation when adjusting



Figure 10.40 Choose Only Calibration from the pop-up menu at the top of the Save Settings Subset dialog box.

these sliders. Once you get your image to look the way you'd like it to, choose Save Settings Subset from the fly-out menu that appears just above and to the right of the Calibrate tab. Choose Only Calibration from the pop-up menu (Figure 10.40) in the Save Settings Subset dialog box, and then click the Save button. Now, the next time you work on an image that you'd like to have the same color qualities as the one you just adjusted, just choose the name of the preset you saved from the Settings pop-up menu. Or, if you'd like to use those settings on all the images you open from that specific camera, choose Set Camera Default from the same menu.

Now that we've made it through all the settings that appear under the tabs on the right side of the Camera Raw dialog box, we're ready to tackle the settings that appear at the bottom of the dialog box. These are the settings that don't affect the overall look of your image, but are still important because they ensure that Photoshop will receive the proper amount of information to make your images look great when they are printed.

Workflow Settings

Just below the preview image, you'll find settings that relate to the general way you choose to work in Photoshop (Figure 10.41). This is where we'll have to deal with some technical mumbo-jumbo that is necessary for Photoshop to reproduce the image properly. Hold on because we're about to jump into the world of bit depth, color spaces, and resolution. It will be a painful but necessary journey, so hold on to your seat...here we go.

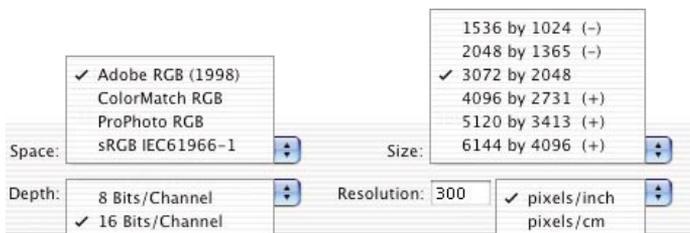


Figure 10.41 The Workflow settings are located below the image preview in Camera Raw.

The Space pop-up menu tells Photoshop the exact colors of RGB that your image is made from, and therefore the range of colors it can contain. I suggest that you set the Space pop-up menu to the same setting you chose for your RGB working space, which we talked about in Chapter 8, “Color Management” (most people use Adobe RGB).

How Many Bits Is That?

Next, you can decide between 8- and 16-bit color depths. Sixteen-bit images contain billions of colors instead of the standard 16 million colors that are possible in an 8-bit file. Sixteen-bit files are ideal when you plan to make radical changes to the brightness and/or contrast of an image after it's opened in Photoshop. But 16-bit files are also twice as big, so Photoshop will run slower, and the files you end up with will be larger than 8-bit files. If you'd like to save space on your hard drive, you can always choose Image > Mode > 8 Bits/Channel after you are done adjusting the image in Photoshop. By doing that, you'll take advantage of the additional color when you need it the most (during adjustment), but you'll end up with a smaller file in the end. I can't think of a single output device that can reproduce more than 8 bits of information, so there really is no advantage to keeping all those extra shades around after you're done adjusting your image.

Previous versions of Photoshop have limited support for 16-bit images, but that has changed in Photoshop CS. You can now use the vast majority of Photoshop's features on 16-bit images. The main exception is that some of the more complex filters will work only after you convert your image to 8-bit mode.

Size and Resolution

After you've decided if you want to jump on the 16-bit bandwagon, you'll need to specify the size and resolution of your image. The combination of these two settings will determine how large your image will be when it's printed or loaded into another program.

The default setting for the Size pop-up menu reflects the native resolution (often measured in megapixels) of the digital camera that was used to take the photo. For instance, a 5 megapixel camera will deliver an image that contains approximately 5 million pixels. If you multiply the two numbers that show up in the Size pop-up menu and then move the decimal place six digits to the left (to see how many millions it is), you can find out how many megapixels your camera is. My camera delivers a 3072×2048 image, which means that it's a 6.3 megapixel camera ($3072 \times 2048 = 6,291,456$).

The Resolution setting determines how large those pixels will be when you print your image. The higher the resolution, the more pixels will fit in an inch, and therefore the smaller they will be. If you were to divide the width of your image (in pixels from the Size menu) by the Resolution setting, you'd be able to find out how wide your image would be when it's printed.

My digital camera delivers a 3072×2048 image and the default resolution setting is 240, so with default settings, I'd end up with a 12.8×8.5 inch image. If I were to raise the resolution setting to 300 (which forces more pixels into each inch, making them smaller), then I'd end up with a 10.24×6.8 inch image instead. I really wish that Adobe would have provided that information so I don't have to do math in my head—after all, there's empty space available just to the right of those settings. That would make it much easier to figure out how to get a 5×7", 8×10", or other standard-size image, but instead you can use Table 10.1 to get an idea of what you'll end up with when using different combinations of Size and Resolution. If you're not sure which Resolution setting you should use, be sure to look over Chapter 4, "Resolution Solutions," which will describe how to pick an appropriate resolution setting.

TABLE 10.1 Common Resolution Settings and Corresponding Sizes in Inches

PIXELS	@72PPI	@128PPI	@150PPI	@170PPI	@200PPI	@225PPI	@240PPI	@266PPI	@300PPI
6144	85.3	48.0	41.0	36.1	30.7	27.3	25.6	23.1	20.5
5120	71.1	40.0	34.1	30.1	25.6	22.8	21.3	19.2	17.1
4096	56.9	32.0	27.3	24.1	20.5	18.2	17.1	15.4	13.7
3413	47.4	26.7	22.8	20.1	17.1	15.2	14.2	12.8	11.4
3072	42.7	24.0	20.5	18.1	15.4	13.7	12.8	11.5	10.2
2731	37.9	21.3	18.2	16.1	13.7	12.1	11.4	10.3	9.1
2048	28.4	16.0	13.7	12.0	10.2	9.1	8.5	7.7	6.8
1536	21.3	12.0	10.2	9.0	7.7	6.8	6.4	5.8	5.1
1365	19.0	10.7	9.1	8.0	6.8	6.1	5.7	5.1	4.6
1024	14.2	8.0	6.8	6.0	5.1	4.6	4.3	3.8	3.4

If you plan to make your image larger or smaller than what its native resolution can provide, you can select an appropriate setting in the Size pop-up menu (**Figure 10.42**). The choices that are available in the Size pop-up menu will be based on how much information your digital camera supplied to Photoshop. Settings with a plus sign (+) next to them will cause Photoshop to scale your image up, which will deliver a larger image, but Photoshop will have to use math (known as interpolation) to create the additional information needed, which might cause the image to look a little soft. You can always sharpen the image in Photoshop, or with the Sharpness slider under the Detail tab in Camera Raw, to compensate for the softness introduced by scaling the image up. Numbers with negative signs (-) next to them will cause Photoshop to scale your image down from its native size. Scaling down does not harm your image, so these settings are very safe to use. Scaling an image up using the Size pop-up menu in Camera Raw will produce a higher-quality result than what you'd get if you scaled the image up in Photoshop. If the exact size you need isn't listed in the Size pop-up menu,

**Figure 10.42** The Size pop-up menu in Camera Raw.

then choose the setting that is closest to what you desire and then use the Image > Image Size dialog box (**Figure 10.43**) in Photoshop to fine-tune the size.

Once you have adjusted the appearance of your image with the settings found under the tabs and specified the size and color depth, you're ready to click OK to open the image in Photoshop.

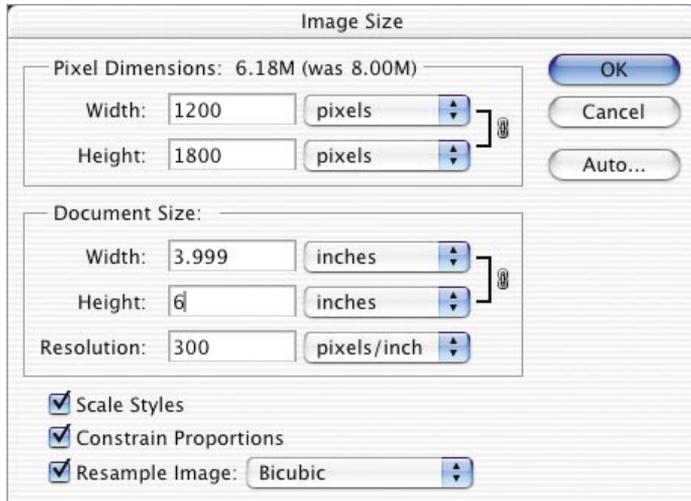


Figure 10.43 The Image Size dialog box.

Finishing Touches

When you open your image in Photoshop, the settings you used will be saved. The next time you open the same RAW format image, Photoshop will remember the settings you used (it remembers all the settings except the ones related to workflow). If you'd rather just save the settings you currently have in the Camera Raw dialog box so that Photoshop will use them the next time you open the image, then hold down the Option key (Mac) or Alt key (Windows) and click the Update button (the OK button changes to Update when Option/Alt is held down). When you do that, Photoshop assumes that you want to attach those settings to your image instead of actually opening it in Photoshop. Updating images can be useful if you plan to use them with Actions or the choices found under the Automate menu in the File Browser.

If you'd rather not use the Camera Raw dialog box when opening a RAW image in Photoshop's regular File Browser, then try holding the Shift key when you open the image. That will bypass the Camera Raw dialog box, but will still use the Camera Raw settings you used the last time you opened the image, or it will use the default settings if you've never opened the image before.

If you have a few images that were shot in similar lighting conditions, you might want to think about opening one of those images and then using the same settings on the subsequent images. You can do that by opening one image with the Camera Raw settings you want to use and then choosing Previous Conversion from the Apply Settings From pop-up menu in the Apply Camera Raw Settings dialog box on the other images. Or, if you have a bunch of images that you'd like to use those settings with, select them in the File Browser and then choose Apply Camera Raw Settings from the Automate menu of the File Browser (Figure 10.44). That will allow you to choose the name of the file you'd like to copy the Camera Raw settings from, or use any of the presets that you saved from the Camera Raw dialog box. Then, when you decide to open the files, you can hold Shift to bypass the Camera Raw dialog box altogether.

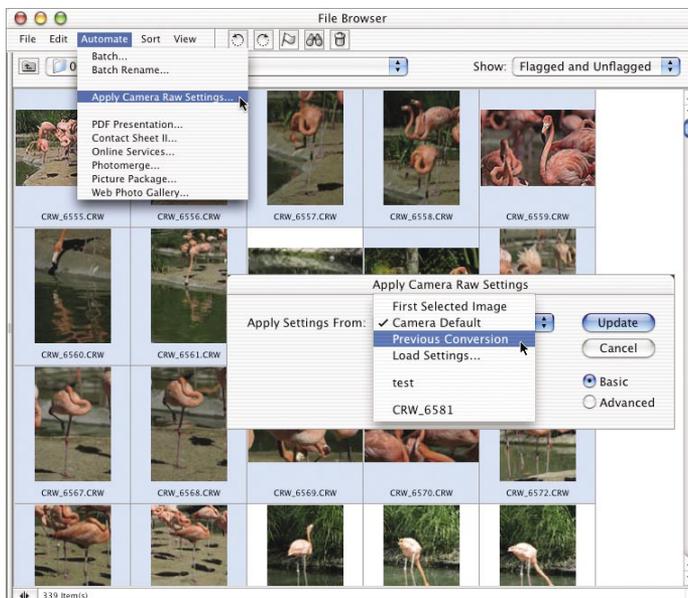


Figure 10.44 Choose Apply Camera Raw Settings from the Automate menu to apply settings to multiple files.



You can turn on the Advanced radio button in the Apply Camera Raw Settings dialog box to have precise control over the settings that will be applied to your file. That's also a quick way to see what all the preset settings contain.



Figure 10.45 The Metadata Display Options dialog box.

Finally, if you're a Camera Raw fanatic, you can choose Metadata Display Options from the side menu of the Metadata tab of the File Browser (**Figure 10.45**). That's where you can turn on the Camera Raw check box so you'll see all the Camera Raw settings that are attached to the file that is currently selected in the File Browser (**Figure 10.46**).

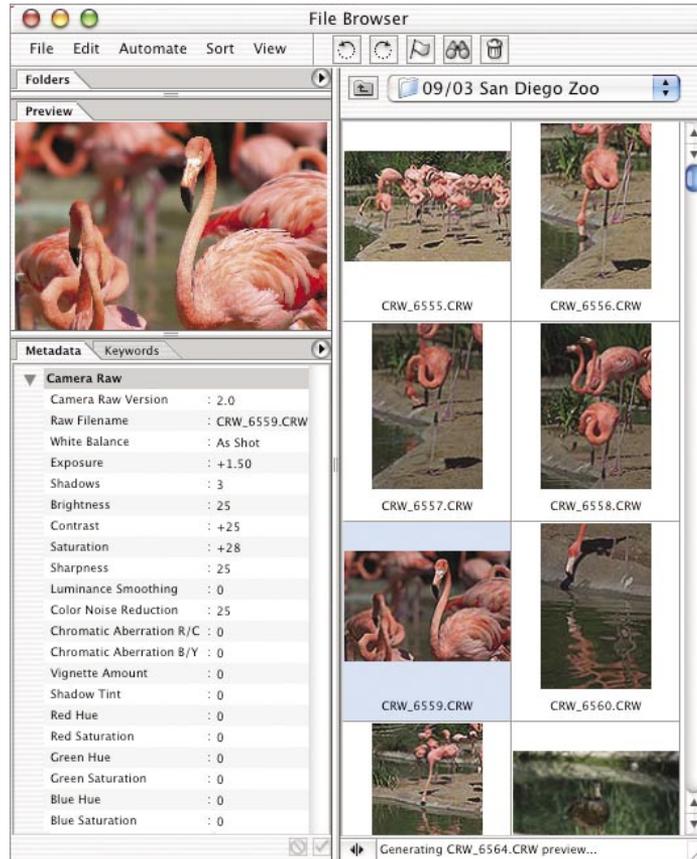


Figure 10.46 Viewing the metadata in the File Browser.

Closing Thoughts

At first glance, the Camera Raw dialog box may look like an unruly beast, and it may have taken me a couple dozen pages to describe all the settings available when working with raw files, but you should know that it usually only takes me about a minute to adjust most images. Once you've gone through the settings a few times, it should be the same for you.

Ben's Techno-Babble Decoder Ring

Chromatic aberration: An effect that causes small halos of different colors on the edges of objects. This happens when a lens focuses different colors of light in different places on the image.

Luminance: Another word for brightness. When someone talks about the luminance of an image, they usually ignore all issues relating to color and just concentrate on what's happening to the brightness of the image.

RAW file format: A special file format that contains the raw data that was captured with a digital camera's sensor. This unadulterated information gives you the most versatility when opening an image in Photoshop. Unlike the other file formats available (like JPEG and TIFF), RAW files allow you to change important settings like White Balance at the time you open the image. JPEG and TIFF images have those settings locked into the image so they can't easily be changed after the photo is taken.

Vignetting: Darkening of the corners and edges of an image due to light falloff in the lens of the camera.

Keyboard Shortcuts

FUNCTION	MACINTOSH	WINDOWS
Switch Tabs	Command-1, 2, 3, 4	Ctrl-1, 2, 3, 4
Rotate Clockwise	R	R
Rotate Counterclockwise	L	L
Toggle Preview	P	P
Bypass Camera Raw dialog box when opening from File Browser	Shift	Shift



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