Nearly every modern photographer knows what Photoshop can do. What does Lightroom bring to the table?

What's the difference?

I spend far too much time online reading various photo-centric Web sites, where the same questions are often asked, such as, "I have Adobe Photoshop and Bridge, why would I need Adobe Lightroom?" It's a logical question. There are significant differences between the two.

Photoshop was designed to edit pixels. To do so, Photoshop needs access to every pixel, even if you'll be editing only 22 out of the 22 million in the file. That can tax your processor and slow your workflow.

Photoshop has to work with rendered pixels. Rendered means that the color values, color space and gamma are baked in. Like a cake recipe gone awry, it's nearly impossible to remove the individual ingredients, remix them properly and re-bake the cake. With Photoshop, you can make a good show of it, but it takes effort, and it's just not as good as it might have been.

Some image corrections are difficult or impossible to achieve on rendered pixels. For example, you can't correct highlight data where none exists as a result of how the initial pixels were originally rendered. Severe white balance adjustments are extremely difficult to correct on rendered images. Altering an image that appears dark, has a severe colorcast, or needs saturation adjustment requires changing pixel values, a slow process that causes data loss.

However, in presenting you each and every pixel, Photoshop has the ultimate set of tools to precisely select and edit only some of these pixels. Consequently, Photoshop works primarily with one image at a time. Droplets and batch commands provide a limited means of working with multiple images; still, each image has to be opened and every pixel has to be loaded into RAM before you can view and manipulate multiple images.

Lightroom at its core is a raw processor. Though you can import existing rendered images, Lightroom is most powerful working with raw, non-rendered, essentially grayscale data to produce new colored pixels that represent how you want to render the image. A raw file is like having individual ingredients that you can remix and re-bake at any time. Rendering isn't color correction, it's image creation. You should minimize, if not eliminate, the need to globally color correct or "fix" pixel-based images.

Lightroom uses instructions (metadata) to describe how a raw image *should* be processed into pixels. It doesn't open a full-resolution, pixel-based image; it shows a series of previews based on how the final image will appear if you tell it to build those pixels. This process has a number of features that Photoshop doesn't. First, it's fast and flexible. You view either a low-resolution preview of the entire image or a screen-size, full-resolution preview (1:1 or greater). The
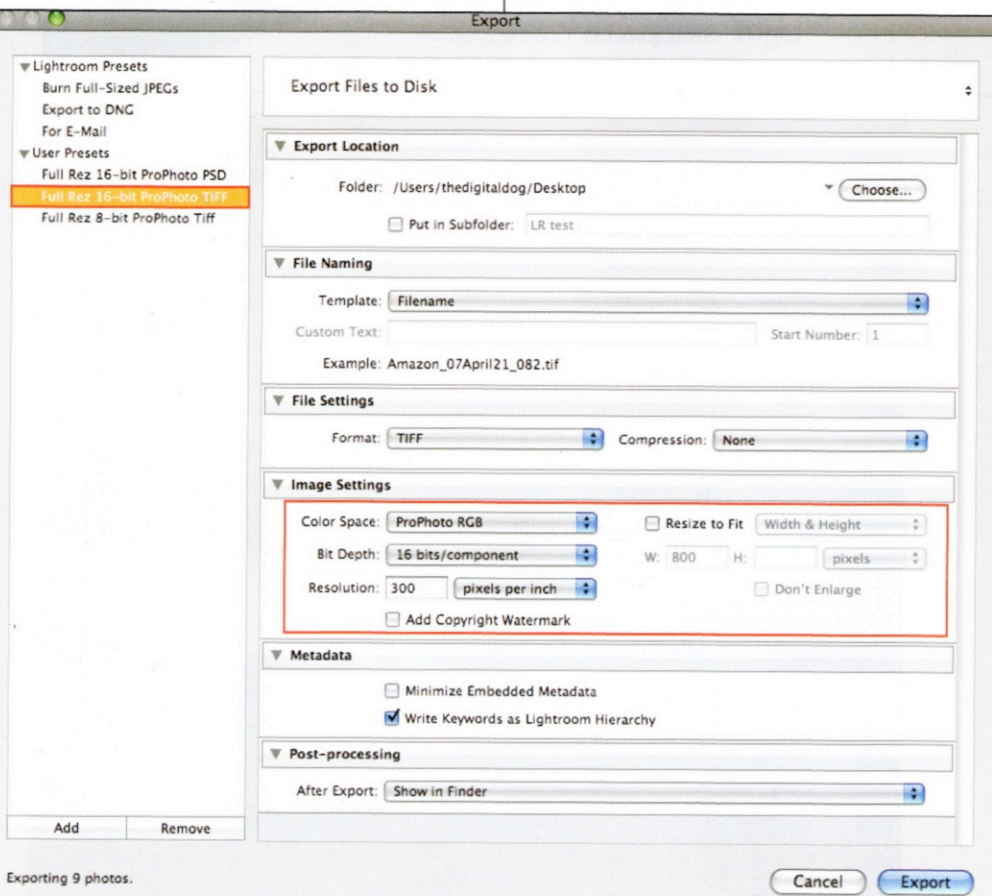

Figure 1: Exporting one or more images selected in Lightroom brings up this dialog, where I can specify how I want my pixels built from the metadata instructions. I asked for full-resolution, 16-bit ProPhoto RGB rendering. I could ask for smaller resolution images in differing ways and these new pixel-based documents could be built as specified.

computer doesn't alter the pixels, it just shows you what the current metadata would produce. You can change your mind at any time, since all you're doing is rewriting the metadata.

Once you want to actually produce a pixel-based document, Lightroom performs a single computation of the metadata to produce a new set of pixels *from* the raw data, which is truly non-destructive editing.

Metadata editing in Lightroom also allows you to quickly apply a set of rendering instructions to multiple images—just copy and paste the metadata instructions from one raw file to others. The computer doesn't need to do the heavy lifting of generating pixels until you tell Lightroom to export the data (or print it from the Print module or upload a Web gallery) based on these instructions (**Figure 1**).

Lightroom has some simple clone-like tools that produce what appear to be pixel-based edits, but are merely an additional set of instructions. Suppose you have 300 raw captures and notice that there was a dust spot on the camera sensor. You can clone out the single spot, and that instruction will be applied when the rendered pixels are built from the raw. Better, you can copy and paste this single set of instructions to all the other images (**Figure 2**). Lightroom will automatically select a clone source and apply the dust removal on all the other images, even if the orientation of the images varies. In Photoshop you'd have to open each image, use the clone tool, then save the image to disk.

Furthermore, if for some reason you don't like how you edited the dust spot (or any instruction-based edit) in one of the 300 images, you can always go back to Lightroom and remove or update that one edit. Unlike Photoshop, the edit list (history states) remains with each image, even if you quit Lightroom. The metadata instructions are either stored

Figure 2: If you have 1,000 images that need the same global correction, it takes only seconds to complete in Lightroom. I copied settings from the image in the upper left, then used the Sync Settings command to bring up this dialog, where I can specify which instructions onto paste to all of the highlighted images.
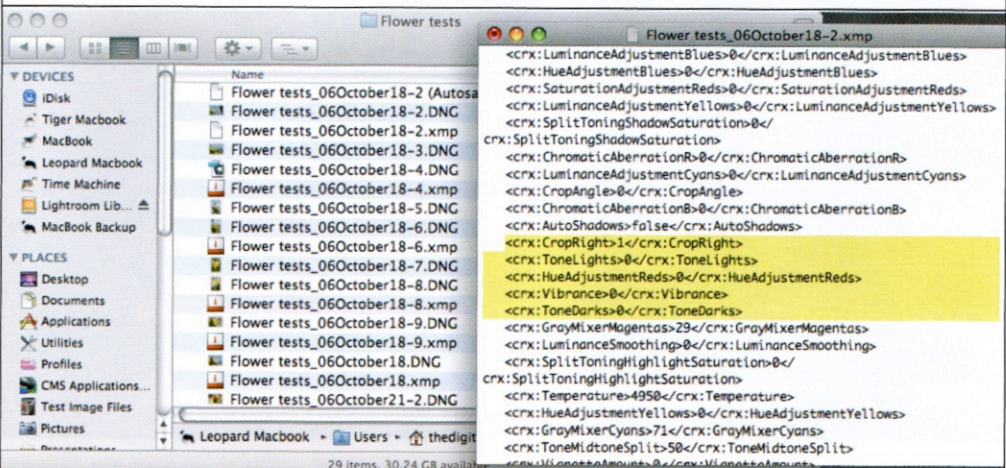

Figure 3. XMP metadata is seen here, opened using a text editor. It describes all the edits of one image, in plain English. Once I convert my images into DNG, this data exists within the DNG, no sidecar files necessary.

as small sidecar files or embedded into a DNG (see www.ppmag.com/reviews/200709_adobedng.pdf).

You can make virtual copies of one raw file and produce multiple sets of instructions without having to create multiple pixel-based images. This saves time and disk space. One version could show the desired color and tone instructions, others could show black and white, with and without a split tone, one a different crop. Each of them can be rendered out to a pixel-based image at any time.

Photoshop becomes a necessity for selective editing, compositing, and complex blending of multiple images. In Lightroom, all instructions for color and tone are global; there are no provisions (yet) for altering only a part of an image. For precise pixel editing, true retouching and compositing, you need to render the images as pixels and work on the data in Photoshop.

Try to conduct all the global tone and color rendering work in Lightroom, then hand off the rest of the work to Photoshop, with the goal of not going back into Lightroom for further global work—possible but somewhat counterproductive.

I've concentrated only on Lightroom's rendering abilities, but it has much more functionality. While Bridge is just a file browser, Lightroom is a database that can be the heart of your digital asset management. There's a module for making Web galleries and a print module that takes printing multiple images to a new level.

Too many people, some Photoshop gurus included, have failed to recognize that they should render the best possible data from the start of the process, at the raw rendering stage. Lightroom gives us the tools to properly render image data and go far beyond what Photoshop can "fix" on an existing pixel-based document. Investigate this exciting new process and think about editing instructions first, then pixels. ∎

Andrew Rodney owns The Digital Dog, a digital imaging training and consulting business in Santa Fe, N.M. The author of "Color Management for Photographers" (Focal Press), he lectures around the country. Rodney is an alpha tester for Adobe Systems, was placed among the "Top 40 Photoshop Experts" by Wacom Technologies, and inducted into the NAPP Photoshop Hall of Fame in 2007. Learn more at www.digitaldog.net.