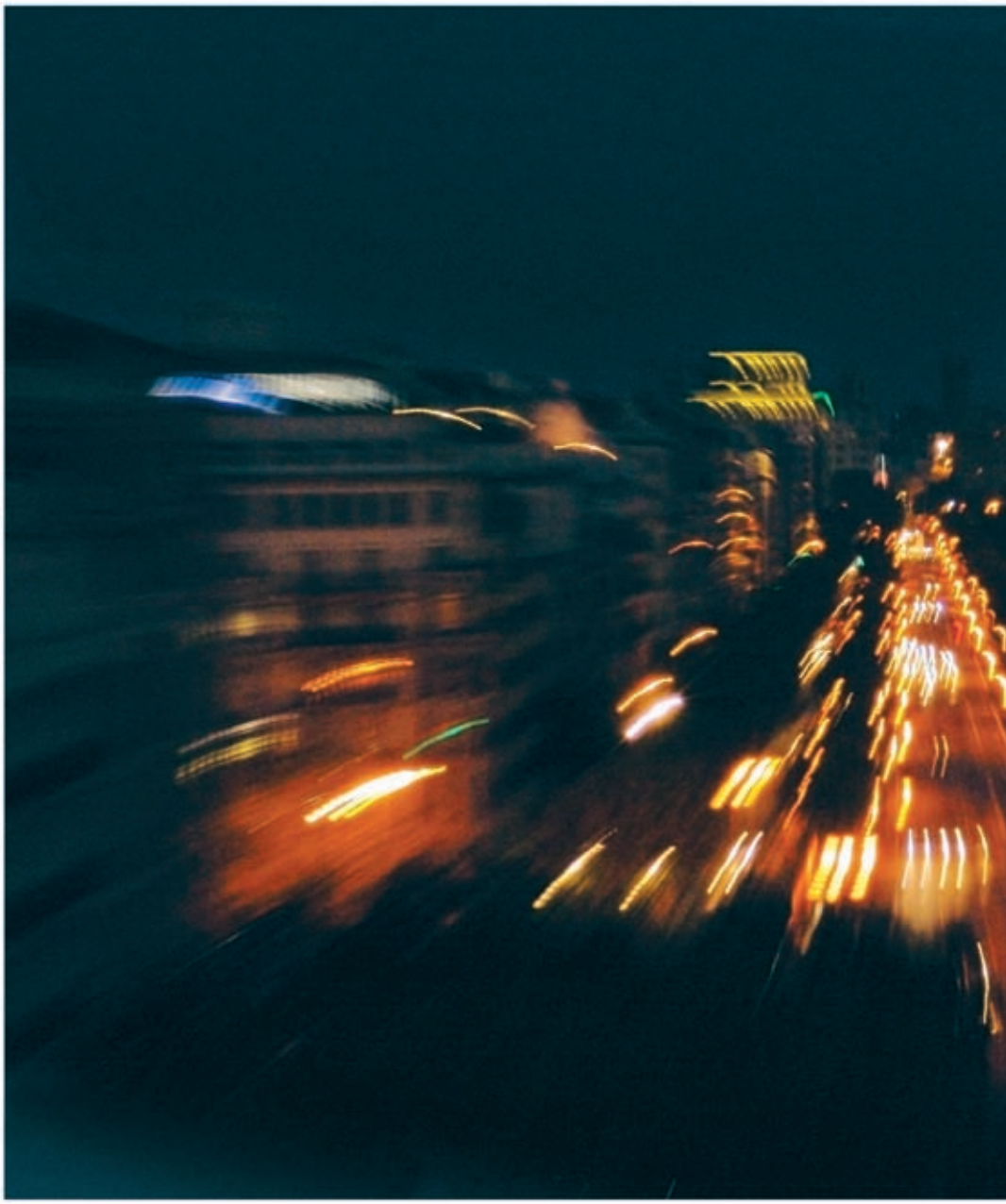
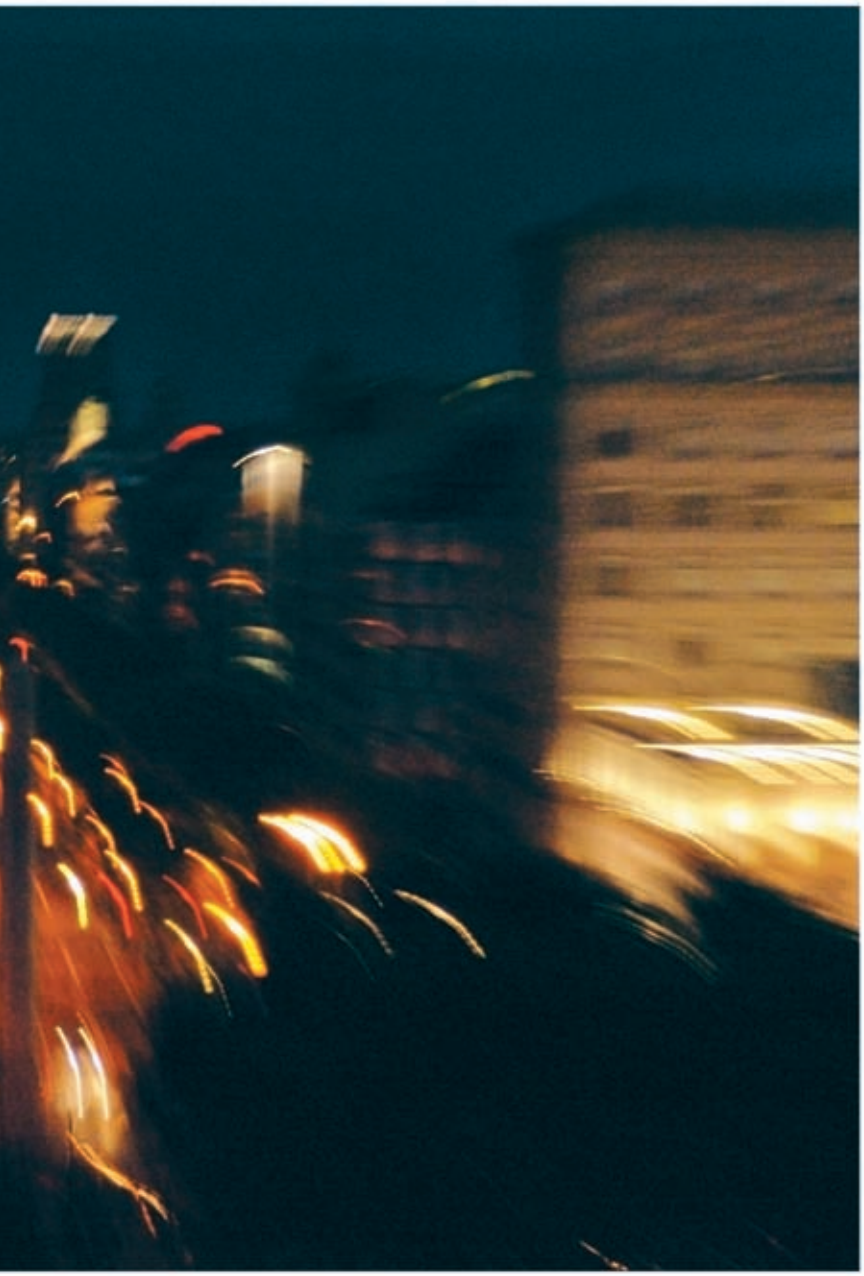


Photographer: Andrew Darlow; **Image title:** *Barcelona 003*; **Print Size**: 60×40 inches; **Media**: HP Artist Matte Canvas; **Printer Name**: HP Designjet Z3100; **Ink Used**: HP Vivera**; Driver**: Standard HP Driver (Windows XP); **Camera**: Sony CyberShot DSC-F828; **Lens**: Built-in Carl Zeiss 28-200mm; **F-stop**: f/5; **Exposure**: 1/5 sec.



Chapter 2

File Preparation: An Overview

Transforming Your Images from Pixels to Prints

To achieve great prints from your files, you can wait for the planets to align, and say a few of your favorite magic words. Or, you can prepare your files in a logical way using a structured workflow. Whether you are printing scanned negatives, transparencies, drawings, digitally captured paintings, scanned 3D objects, or digital photographs, these tips should help make the process faster and easier. Though not exactly a step-by-step tutorial, the tips in this chapter are presented in the order I usually approach my printing projects. Throughout the book, more tips for preparing files will be covered—the more you know about optimizing your images, the better your prints will be.

To find the web links noted in the book (L2.1, etc.), visit www.inkjettips.com or http://www.courseptr.com/ptr_downloads.cfm.

TIP 18 Find appropriate imaging books and look for good magazine and web resources.

Regardless of how your work originates (from a film scan, digital photograph, or direct scan with a digital camera), you can benefit from reading books, magazines and online resources that cover various imaging topics. A list of recommended books, magazines and web sites are available at inkjettips.com, with many specific suggestions for photographers and other artists (L2.1).

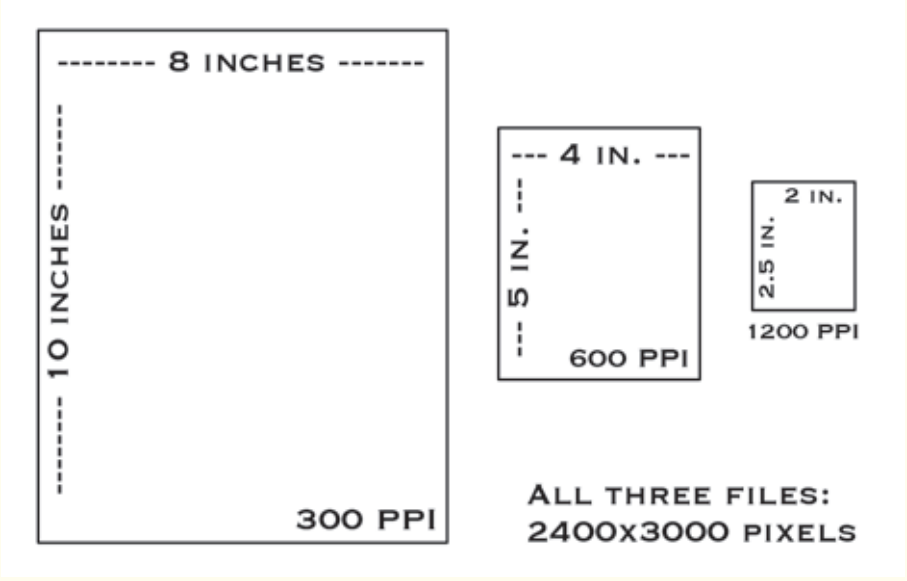
TIP 19 Learn the difference between DPI and PPI.

Designers, photographers and others who work with digital files often misunderstand the difference between the terms DPI and PPI. DPI, or dots per inch, is used to define a printer's resolution (for example, many inkjet printers can print a certain number of dots per inch, and this can be specified in the printer software as a number, such as 360 DPI, 720 DPI, 1440 DPI, etc). PPI, or pixels per inch, represents a digital image's resolution on a monitor or in a digital file (the number of pixels across a distance of one inch, such as 200 PPI, 300 PPI, etc.).

Photographer: Andrew Darlow; **Image title**: *NYC 002*; **Print Size**: 17×22 inches; **Paper**: Hahnemühle Fine Art Pearl; **Printer Name**: Canon imagePROGRAF iPF5000; **Ink Used:** Canon LUCIA**; Driver**: Canon Print Plug-in for Photoshop (Mac OSX); **Camera**: Canon EOS-D60; **Lens**: Canon EF16-35mm f/2.8L; **F-stop**: f/19; **Exposure**: 1 sec.

TIP 20 Learn about resolution and file dimensions.

Far too often, resolution is perceived as being complicated, but it doesn't have to be. One of the best ways to help grasp resolution is through a simple illustration. A common file might be 8 by 10 inches at 300 PPI. This translates to 2400 pixels (8 × 300 pixels) by 3000 pixels (10 × 300 pixels), or 7,200,000 pixels total (very similar to the files that a 7-megapixel camera produces). Unless we know that the file is 8 by 10 inches, we would not know how many pixels per inch it is. The same 2400 × 3000 pixel file could also be represented as 4 × 5 inches at 600 PPI, or 2 × 2.5 inches at 1200 PPI.



These three illustrations show how three different files, each with the same exact number of pixels (2400×3000) can have very different dimensions because of their different resolutions (PPI).

TIP 21 Choose an appropriate resolution for your prints.

For optimum quality, there are some rules of thumb with regard to what PPI you need at final print size for high quality prints from bitmapped images such as scans and digital photos. Setting your image to exactly 180 PPI, 240 PPI, or 360 PPI at its final output size can result in better print quality because of the way in which those PPI numbers are handled by some print drivers and RIPs when files are printed at 100%. RIPs (Raster Image Processors) are described in greater detail in Chapter 5, "Black and White and RIPs."

Photographer: Andrew Darlow; **Image title**: *L.A. 002*; **Print Size**: 13×19 inches; **Paper**: Ilford Galerie Classic Smooth Pearl; **Printer Name**: Epson Stylus Photo R2400; **Ink Used:** Epson UltraChrome K3**;** **Driver**: Standard Epson Driver (OSX); **Camera**: Canon EOS-D60; **Lens**: Canon EF16-35mm f/2.8L; **F-stop**: f/5.6; **Exposure**: 3 sec.

In most cases, you will see no difference in print quality if your resolution is somewhere between the suggested numbers (for example, 268 PPI). This is important because it is much more convenient to have just one version of a file to make various sized prints. If every file had to be resized to exactly 180 PPI, 240 PPI, or 360 PPI at its final print size, it would create the need for additional files. For smaller prints (under 8 × 10 inches) use higher resolutions (about 300 PPI) at the final print size. When making large prints (over 30 × 40 inches) you can usually get very high quality results with lower resolutions (even as low as 100–150 PPI at the final print size). I recommend doing your own tests to determine if you can see differences in print quality at various resolutions.

TIP 22 See how file sizes change as PPI increases in The Resolution Chart.

Another visual representation of resolution can be seen in the following chart. The chart shows approximate file sizes for RGB uncompressed TIFF files based on their dimensions (along the left side) and their resolution in pixels per inch (across the top). Uncompressed files, as opposed to compressed files, such as JPEG, do not degrade in quality when saved because no image data is discarded to compress the file. A very large file (for example, 16 × 20 inches at 300 PPI) when opened in a program like Photoshop might actually be very small (when measured in megabytes) if it was saved as a JPEG (especially if saved as a low- or medium-quality JPEG).

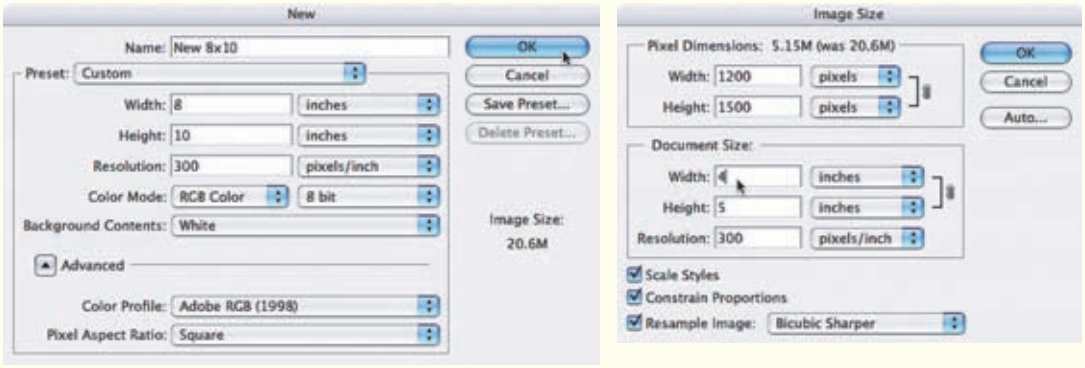
FILE DIMENSIONS	100PPI	150PPI	200PPI	230PPI	269PP1	320PPI	400PPI	650PPI	RES 30 762PPI	RES 40 1016PPI
35mm (24mmx35mm)	40k	89k	157k	208k	284k	402k	628k	1.815	2.49	4.4325
6cm x 4.5cm	123k	276k	490k	648k	870k	1.23	1.92	5.0625	6.9525	12.375
6cm x 6cm(2.25" sq.)	164k	368k	653k	847.5k	1.1625	1.635	2.5575	6.7425	9.3	16.5
6cm x 7cm	191k	429k	762k	982.5k	1.3575	1.905	2.9775	7.875	10.8	19.2
6cm x 9cm	245k	551k	960k	1.2675	1.7475	2.4525	3.8325	10.125	13.875	24.75
4" x 5"	586k	1.29	2.2875	3.03	4.17	5.8575	9.15	24.15	33.225	59.1
5" x 7"	1.005	2.25	4.005	5.295	7.2975	10.275	16.05	42.3	58.125	103.35
8" x 10"	2.2875	5.1525	9.15	12.075	16.725	23.475	36.6	96.675	132.9	236.25
8.5" x 11"	2.6775	6.0225	10.725	14.175	19.5	27.375	42.825	113.025	155.325	276.15
11" x 14"	4.41	9.9	17.625	23.325	32.1	45.15	70.5	186.15	255.825	454.8
11" x 17"	5.3475	12.075	21.375	28.275	39	54.825	85.575	226.05	310.65	552.3
14" x 18"	7.2075	16.2	28.875	38.175	52.575	73.8	115.35	304.65	418.65	744.225
16" x 20"	9.15	20.625	36.6	48.45	66.75	93.75	146.475	386.85	531.6	945.075
20" x 24"	13.725	30.9	54.9	72.675	100.125	140.625	219.75	580.2	797.4	########
24" x 30"	20.625	46.35	82.425	108.975	150.15	210.975	329.625	870.3	1196.1	NA
30" x 40"	34.35	77.25	137.325	181.65	250.275	351.6	549.3	########	NA	NA
36" x 48"	49.425	111.225	197.775	261.525	360.375	506.25	NA	NA	NA	NA
40" x 60"	68.7	154.5	274.65	363.225	500.55	703.125	NA	NA	NA	NA
48" x 96"	131.85	296.625	527.325	697.425	961.125	NA	NA	NA	NA	NA

This resolution chart helps to determine appropriate file sizes for digital printing.

To use the chart, just choose a print size, then select a resolution to determine the file size. For example, choose 11 × 14 inches and 200 pixels per inch. In the box where they meet (17.63 MB) is the file size. The chart is especially helpful for determining how large a file should be scanned or prepped to make a specific size print. As you can see in the highlighted area of the chart, when you double the PPI and keep the same dimensions (for example, 11 × 14 at 400 PPI), the file size quadruples (70.5 MB).

TIP 23 Use Photoshop as a Resolution Calculator.

Much like The Resolution Chart (but much more precise and flexible), Adobe Photoshop's File>New dialog box and Image>Image Size dialog box are excellent tools for examining different print sizes and for determining what sizes the files will become when resolution or image dimensions change. Also note that the Color Mode (for example, RGB or Grayscale) and 8-bit versus 16-bit, seen below the width, height, and resolution boxes, will affect the file size. An RGB file will be three times the size of a grayscale image with the same width, height, and resolution and a 16-bit file will be twice the size of an 8-bit file.



(Left) The File>New dialog box in Photoshop being used as a resolution calculator. Notice how the Image Size on the right changes depending upon what numbers are inserted into the width, height, and resolution boxes. (Right) The Image>Image Size dialog box can also serve as a resolution calculator.

TIP 24 Set your file size to its print size.

In most cases, I recommend sizing your images to 100% of their print size to minimize the chance of making an error when printing an initial print, or when reprinting an image for an edition. However, if you are making extremely large prints, or importing your image files into a RIP or page layout program, there may be a good reason to keep the files at a smaller size, such as 50% of the print size. Images can then be output at 200% or any other zoom level.

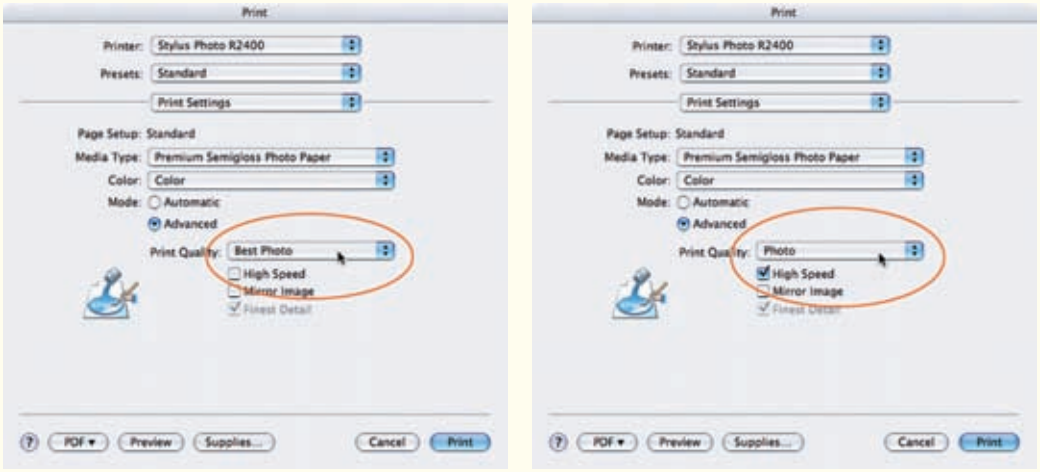
TIP 25 Calibrate and profile your monitor and printer, and print a standard calibration image.

These tips are covered in greater detail in Chapter 4, "Color Management and Driver Tips," but it is important to note them here because it is at this stage that you want to make sure your monitor and printer are in a calibrated and profiled state to begin the testing process. A standard calibration image, such as the very popular PhotoDisc target, or the custom-made smaller target I created are available for download (L2.2) to help you judge the quality of your screen and test prints.

TIP 26 Print a test at multiple resolutions and with different settings.

Because every printer model is different, you can find just the right settings by running a few tests. First, output a test print of a small image, or a small section of an image, at different printer resolutions, such as 720 DPI, 1440 DPI, etc. Then print the same cropped section from an image at different resolutions, such as 180 PPI, 240 PPI, etc. It's best to start at higher resolutions and then size down your file in increments to test it at lower resolutions. You don't want to size up or "interpolate" your file when doing this test because that will degrade image quality.

You can also print with certain features checked, then unchecked, such as "High Speed," which on Epson printers causes the printer to print in bi-directional mode (the print head puts down ink in both directions), as opposed to uni-directional.



The Epson Stylus Photo R2400 driver shown with two possible configurations (circled in red).

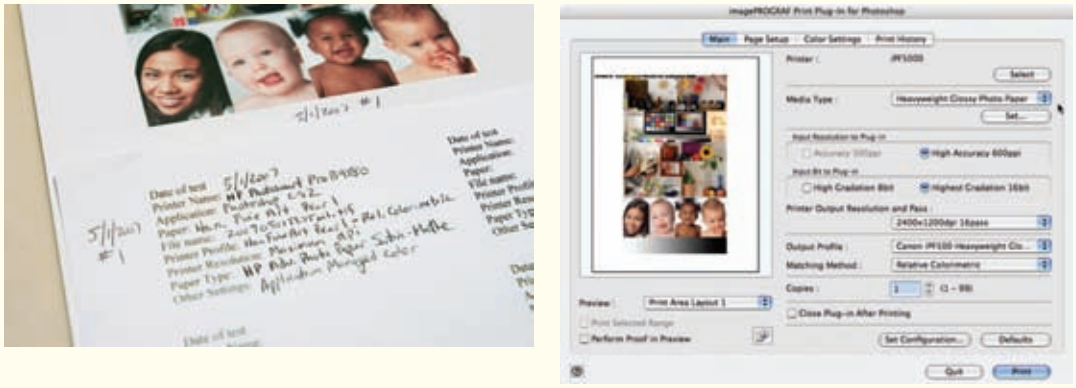
Photographer: Andrew Darlow; **Image title**: *L.V. 003*; **Print Size**: 13×19 inches; **Paper**: Oriental Graphica RC Professional Luster; **Printer Name**: Epson Stylus Photo R2400; **Ink Used:** Epson UltraChrome K3**;** **Driver**: Standard Epson Driver (OSX); **Camera**: Canon EOS-D60; **Lens**: Canon EF16-35mm f/2.8L; **F-stop**: f/5.6; **Exposure**: 3 sec.

If a lower resolution printer setting and low- to medium- resolution file yields a print that matches your quality needs, then you will be able to print your work much faster, using considerably smaller files.

TIP 27 Take notes and change file names when necessary.

Regardless of the testing that you do, be sure to label your prints with details such as: Date of Test, File Name, Printer Name, Paper Name, Printer Profile used, Printer Resolution, File PPI, and any check boxes you may have chosen (such as "finest detail"). It will serve you well as you start printing a series of tests. I've prepared a worksheet and made it available for download to make the process easier (L2.3). Just print it on standard bond paper and use a glue stick or tape to adhere a section to the front or back of your test prints. Or you can print the document on crack and peel adhesive label sheets (L2.4), and then cut them out and affix them to your prints. If you plan to do multiple tests on the same paper, writing just a reference number, then filling out the form can avoid potential problems with the label coming off inside the printer.

You can also take screen shots of the print dialog boxes that you have set up, or you can keep track of your settings by inputting text (called "metadata") in Photoshop or another software program—Chapters 13 and 16 have more tips that cover this. If you make adjustments to an image file as you make test prints, it's a good idea to rename the file to avoid confusion. I like to use m1, m2, etc. after the file name as I make edits and new prints (for example, 20070628NYC003m2.psd).



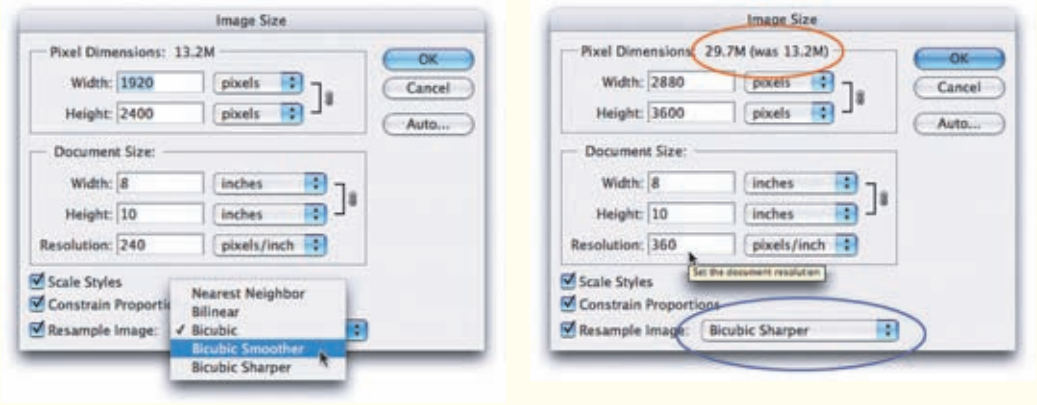
(Left) A test print using the worksheet mentioned in Tip 27. (Right) A screen shot of the Canon imagePROGRAF iPF5000 Print Plug-in for Photoshop, which simplifies the process of setting profiles and output quality choices.

Photographer: Andrew Darlow; **Image title**: *Barcelona 004*; **Print Size**: 35×50 inches; **Media**: HP Artist Matte Canvas; **Printer Name**: HP Designjet Z3100; **Ink Used**: HP Vivera**; Driver**: Standard HP Driver (Windows XP); **Camera**: Sony CyberShot DSC-F828; **Lens**: Built-in Carl Zeiss 28-200mm; **F-stop**: f/5; **Exposure**: 1/5 sec.

TIP 28 Interpolate in steps using Bicubic Smoother or Sharper.

Sometimes, your image won't be large enough to print well at its native size. If you are unable (or simply prefer not) to rescan your original film, or if your digital camera file has been captured at its largest size, then you should consider interpolating, or creating new pixels from your original image. In Photoshop CS2 or Photoshop Elements (L2.5), you can interpolate up and hold good detail by choosing the image size option and then entering a resolution about 50% larger than the current resolution, making sure that the "Resample" box is checked, with Bicubic Smoother selected in the dialog box.

If you want to go larger, you can do so by repeating the process, but your image will get softer and more pixilated as you interpolate up. Conversely, you can size down your files and retain better image quality (compared with just using Bicubic) by choosing Bicubic Sharper.



(Left) Photoshop's Image>Image Size dialog box before interpolating, and with Bicubic Smoother selected. (Right) The Image Size dialog box after upsizing by 50% (note the change in file size—circled in red).

TIP 29 Interpolate using special software.

A number of software options exist to help make images larger with the goal of retaining as much image detail as possible. Most of these are sold in the form of plug-ins for Adobe Photoshop or Adobe Photoshop Elements. One of the most popular of these programs is named Genuine Fractals from onOne Software (L2.6). Another interpolation plug-in from onOne is named Pxl SmartScale, and another option is Alien Skin Software, with their plug-in, Blow-Up (L2.7). Plug-ins add to the

Photographer: Andrew Darlow; **Image title:** *NYC 004*; **Print Size:** 17×22 inches; **Paper:** Hahnemühle Fine Art Pearl; **Printer Name:** Canon imagePROGRAF iPF5000; **Ink Used:** Canon LUCIA; **Driver:** Canon Print Plug-In for Photoshop; **Camera:** Canon EOS-D60; **Lens:** Canon EF16-35mm f/2.8L; **F-stop:** f/11; **Exposure:** 1/4 sec.

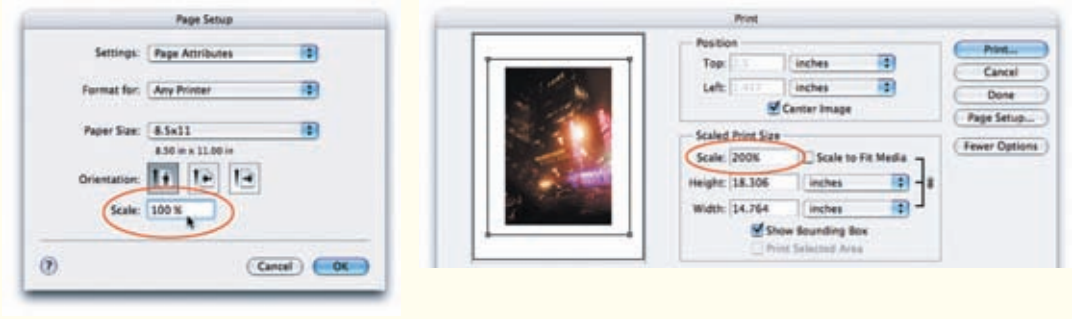
functionality of programs and they are commonly used in Photoshop. To keep information as current as possible, I've compiled a list of interpolation options with comments about those that I have used (L2.8).

TIP 30 Interpolate using the print and scan method.

Another interpolation method takes more work but can produce excellent results. To use this method, print a sharp glossy print using a high quality inkjet printer or a direct digital printing process, and then have the print drum scanned (or scanned on a high quality flatbed scanner) to achieve an appropriate file size. Make sure the print has no lines with jagged edges or imperfections, or they will be magnified when scanning. I've seen bus-sized graphics printed from high quality scans of 16 × 20 inch photographic prints.

TIP 31 Interpolate through the driver.

Another option is to size your file up by printing at a certain percentage in your printer's driver. A printer driver is the software that controls your printer. It interprets your digital file and translates it into a series of dots. I generally don't interpolate in the driver, but it will work, and it is worth testing. Just note that there are two places to increase image size when printing from Photoshop—the File>Print with Preview window and the File>Page Setup window. I recommend setting the File>Page Setup option to 100% and doing any driver resizing in the File>Print with Preview dialog box.



(Left) The File>Page Setup dialog set to 100%. (Right) The File>Print with Preview (File>Print in Photoshop CS3) dialog box set to 200%.

TIP 32 Know some sharpening history and Photoshop's built-in options.

The use of sharpening techniques has been an important concern in the art world for hundreds (if not thousands) of years. An illustration of this was shown by Photoshop Hall of Fame member and author Dan Margulis (L2.9), when he printed in his book, *Professional Photoshop*, an image of a 16th Century painting by El Greco, to demonstrate how the artist painted a halo around the hand of Jesus to create the illusion of sharpness. Margulis then demonstrated a number of sharpening techniques using Photoshop's built-in tools, and they are still valid today.

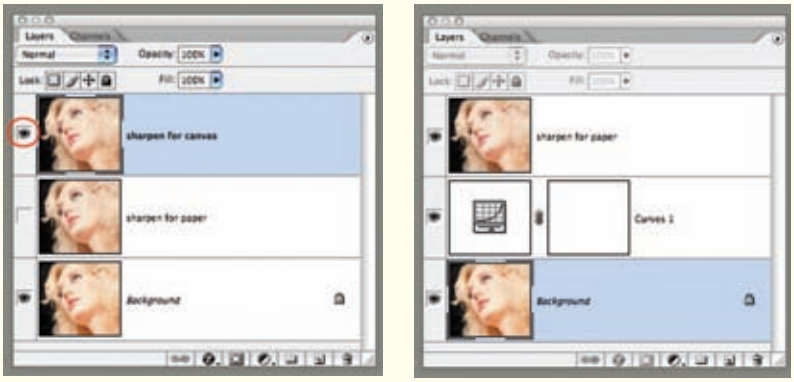
Photoshop has a filter called Smart Sharpen, which can be effective, though my favorite sharpening techniques in Photoshop are Unsharp Mask and an approach known as High-Pass Sharpening (L2.10).

(Left) An image before using High-Pass sharpening.
(Right) The same image after High-Pass sharpening was applied (using the soft light blending mode).

TIP 33 Sharpen with care and keep sharpening on a separate layer (or layers).

Some printer and paper combinations will show artifacts or unnatural halos if images are sharpened too strongly, and others will benefit from aggressive sharpening. Either way, I recommend sharpening on a separate layer in Photoshop so that you can dial back the intensity (opacity) and tailor the sharpening for different printers, monitors, projectors, etc. To do this, duplicate your background layer, and then apply sharpening to it. By duplicating a sharpening layer, the effect of multiple sharpening

layers can be viewed. If you have a multi-layered Photoshop document that you would like to sharpen without flattening the layers, there is a special key command that can be used in Photoshop to merge all the layers into a single layer (L2.11). As with most things related to inkjet printing, make test prints to determine what level of sharpening looks good to you.



(Left) Photoshop's Layer Palette, showing how two duplicate layers of the background could be used as separate sharpening choices by enabling the eye—circled in red.
(Right) Using the merge shortcut in Photoshop's Layer Palette to make a new layer comprised of the layer contents that are below it.

TIP 34 Try sharpening using other options.

Sharpening can also have the effect of adding noise, and PixelGenius offers a fantastic sharpening tool called PhotoKit SHARPENER (L2.12) to help control the amount of noise in areas that you would generally not want sharpened, such as solid dark areas, while sharpening areas that contain detail. The software has options for sharpening prior to editing (called Capture Sharpening) and other options for sharpening based on a number of factors, such as your chosen output device. There are several excellent workflow PDFs on the PixelGenius web site for the software, as well as for other PixelGenius products (L2.13).

Another tool worth investigating is Nik Software's Nik Sharpener Pro 2.0 (L2.14), which has a very easy to use interface, with the ability to sharpen or not sharpen by selecting different color ranges. I also came across a great review of "Fractal Sharpening," by Uwe Steinmueller (L2.15). He describes a process using Noel Carboni's dSLR Fractal Sharpen Actions (L2.16) which is well worth investigating. And another plug-in suite that I learned about (and saw impressive results from) in a book by George DeWolfe (L2.17) is called Optipix (L2.18), from Reindeer Graphics. The

Photographer: Andrew Darlow; **Image title**: *NYC 005*; **Print Size**: 13x19 inches; **Paper**: HP Advanced Photo Paper, Satin-Matte; **Printer Name**: HP Photosmart Pro B9180; **Ink Used**: HP Vivera**; Driver**: Standard HP Driver (OSX); **Camera**: Fujifilm FinePix S20 Pro; **Lens**: Built-in lens (35mm equiv: 35-210mm); **F-stop**: f/4; **Exposure**: 1/2 sec.

software includes sharpening plug-ins including Refocus, Safe Sharpen, Edge Enhancer, and Detail Sharpener. Reindeer Graphics also has a free "Select Edges" plug-in on their web site which can make a dramatic difference in many images when used properly.

TIP 35 Add noise in Photoshop to create film grain in your images.

Adding noise to digitally captured or upsized images can often make them look less "digital" and more like images captured on traditional film. I first saw the power of this in a presentation by photographer and PixelGenius member Jeff Schewe (L2.19), who enlarged a file from a 3.1 megapixel Canon EOS-D30 digital SLR using Photoshop (prior to the built-in Bicubic Smoother option) to about 20 × 30 inches, added noise, then printed the image on an inkjet printer. The final print looked very natural—similar to what I would expect from a pro lab that makes digital or dark-room prints.

Following are the settings I often use when adding noise to images using Photoshop's noise filter (Filter>Noise>Add Noise)—Uniform, with Monochromatic checked. Photoshop's preview at 100% (1:1) will give you a good overview of what to expect, but to really see the effect, it is best to make test prints using different noise settings. You may be surprised how well "noisy" images onscreen look when printed. Noise should also be applied on a separate layer, just like sharpening (refer to Tip 33).

Photos © Andrew Darlow

Before and after effect of adding noise with Photoshop's Filter>Noise>Add Noise filter. The photo on the right shows the settings that were used.

Photographer: Andrew Darlow; **Image title**: *E.T. 014*; **Print Size**: 17×22 inches; **Paper**: Epson Premium Semigloss; **Printer Name**: Epson Stylus Pro 4800; **Ink Used**: Epson UltraChrome K3**; Driver**: Standard Epson Driver (OSX); **Camera**: Sony CyberShot DSC-F828; **Lens**: Built-in Carl Zeiss 28-200mm; **F-stop**: f/8; **Exposure**: 2 sec.

TIP 36 Add or remove noise using other software options.

PixelGenius makes PhotoKit for Photoshop and Photoshop Elements. The product is fantastic, and includes a wide range of effects, including options to quickly add noise in ways that simulate a number of different film grains (L2.20). Another great piece of software for adding "grain" as well as simulating many film stocks is Alien Skin Software's Exposure (L2.21). The software has a powerful, easy-to-use interface, and like most of the software mentioned here, can be tested by downloading a sample from the company's web site.

Now that you know how you can add noise, there are a number of well-made plug-ins and standalone software programs for reducing noise in digital images, and the results can be truly amazing (L2.22).

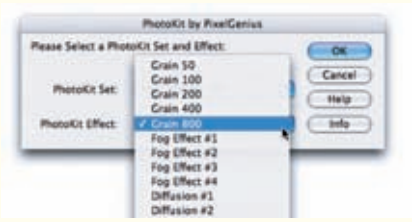


Photo © Andrew Darlow

(Left) A dialog box showing noise options in PixelGenius's PhotoKit.
(Right) An extreme grain "profile" applied using Alien Skin Software's Exposure plug-in.

TIP 37 Save your layered file and flatten before printing.

It's easy to end up with a file stacked high with layers. My recommendation, primarily when printing very large files with more than two layers, is to flatten your Photoshop or Photoshop Elements Layers before printing to save time and to reduce the chance of printer errors. Be sure to save the layered file first, and then save the flattened file with another name, such as 20070628NYC003m2F.psd (F for flattened). If edits are necessary, then reopen the layered file and flatten it again before printing.

Photographer: Andrew Darlow; **Image title**: *NYC 006*; **Print Size**: 17×22 inches; **Media**: Canon Heavyweight Satin Photo Paper; **Printer Name**: Canon imagePROGRAF iPF5000; **Ink Used:** Canon LUCIA**; Driver**: Canon Print Plug-in for Photoshop; **Camera**: Fujifilm FinePix S20 Pro; **Lens**: Built-in lens (35mm equiv: 35-210mm); **F-stop**: f/2.8; **Exposure**: 1/45 sec.

TIP 38 Understand the benefits of working in 16-bit color or grayscale mode.

Images can be scanned from film or processed from RAW digital camera files into 8-bit files (256 levels of gray per channel, e.g., RGB) or high-bit files called 16-bit in Photoshop, containing thousands of levels of gray per channel. RAW digital camera files (unlike JPEG files) are not compressed or processed in the camera, and by shooting in a camera's RAW format, significant adjustments can be made in contrast and color via software such as Photoshop's built-in Camera Raw, Adobe Photoshop Elements, Adobe Photoshop Lightroom, Apple iPhoto, and Apple Aperture.

Photoshop offers many of the same tools for editing 16-bit images as it does for 8-bit images, and editing in 16-bit can help reduce banding. Banding appears in images as visible bands of color or gray—often seen in a stair-stepped pattern. Gradients in skies and skin tones also tend to look smoother when adjusted in 16-bit color. Sharpening can be done when in 16-bit color mode in Photoshop, which can give images a cleaner overall look.

TIP 39 Consider printing from 16-bit files, especially with grayscale images.

When printing to an inkjet, many drivers, plug-ins and RIPs will allow you to print directly from the 16-bit file. It is important to note, however, that 16-bit files are twice the size of 8-bit files (assuming there are no extra layers), and in many cases, you will not see any discernable difference in your print quality between images that begin as 8-bit versus 16-bit files. Also note that your scans or digital camera RAWs need to originate in 16-bit color. You can't just change a file from 8-bit to 16-bit and expect it to magically gain the advantages of high-bit data. I personally think that when scanning black and white negatives in grayscale (one channel), 16-bit should almost always be chosen because grayscale images are more prone to visible banding, and the file size will still be lower than an 8-bit RGB file.

Photographer: Andrew Darlow; **Image title**: *L.V. 006*; **Print Size**: 18×24 inches; **Paper**: HP Premium Plus Photo Satin**; Printer Name**: HP Designjet 90; **Ink Used**: HP Vivera; **Driver**: Standard HP Driver (Mac OSX); **Camera**: Canon EOS-D60; **Lens**: Canon EF16-35mm f/2.8L; **F-stop**: f/4.5; **Exposure**: 1/15 sec.