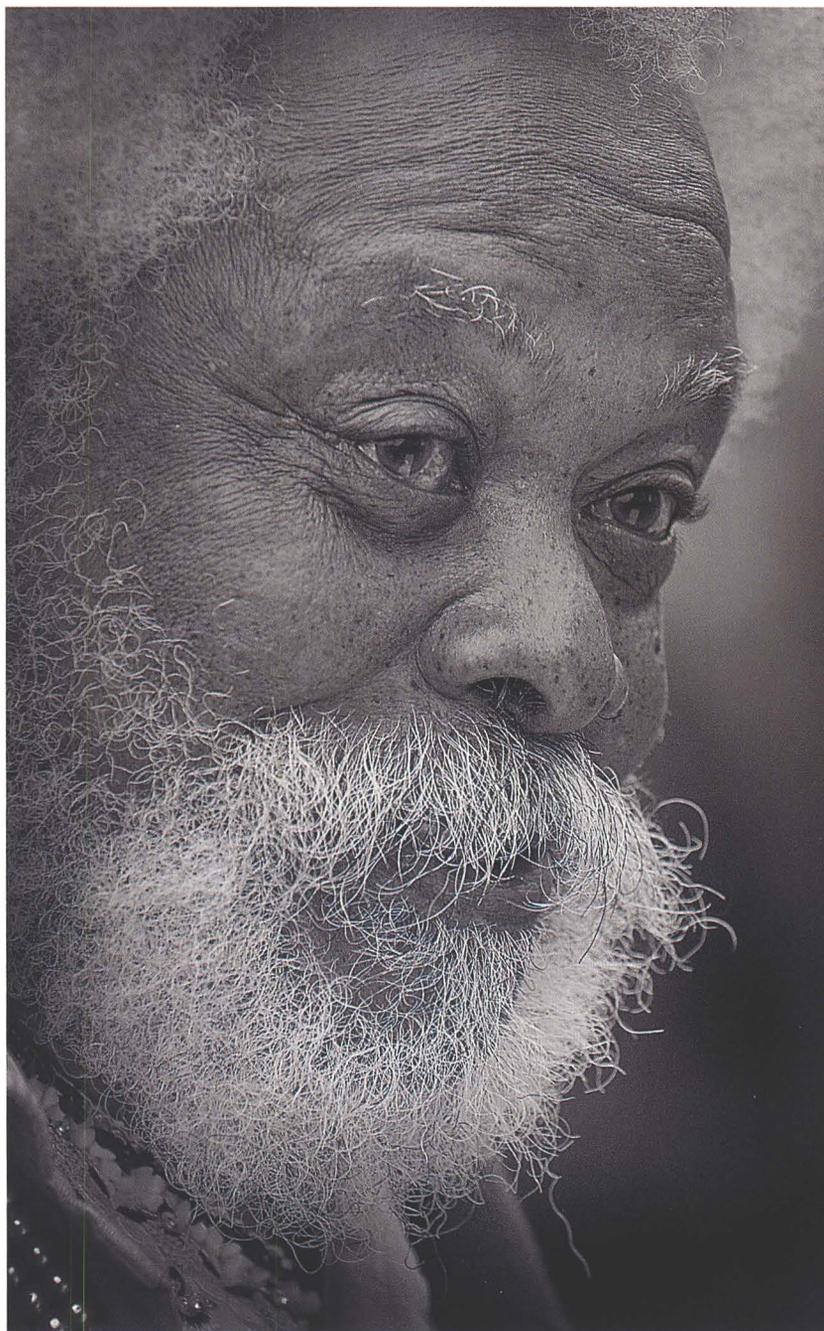


# PRINT OR OUTPUT SHARPENING

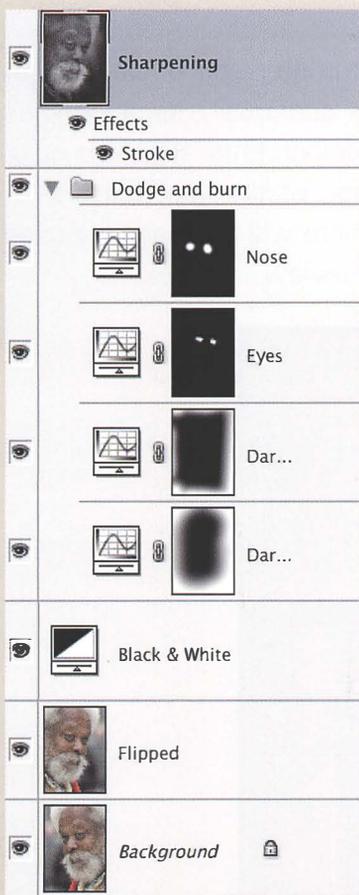
From the moment light signals are registered by the sensor, right through to when the picture goes to the printer, the image loses sharpness and definition each time it is transferred from one medium to another. The printed picture will not match the sharpness of the image on your monitor, and further sharpening is necessary purely for the printing process. This is what Bruce Fraser called “output sharpening.”

Output or print sharpening needs to be done at the very end of the editing process, after the picture has been scaled to its final print size. This is important because sharpening is like a rim or halo around the edges within the picture, and remains effective yet imperceptible if it is around 1/100 of an inch (0.25 mm) on the final output. If you correctly sharpened a picture and printed it at Letter or A4 size on a 300dpi inkjet printer, that sharpening rim would be too small to be effective if you then decided to resize the picture and make a smaller print.



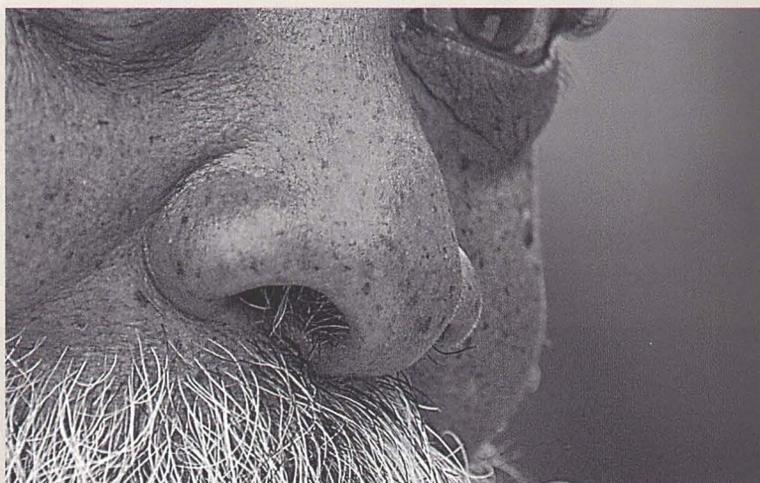
**Right:** *Computer screens and printers have very different output resolutions. You should always evaluate sharpening by examining the final print.*

## HOW SHARP?

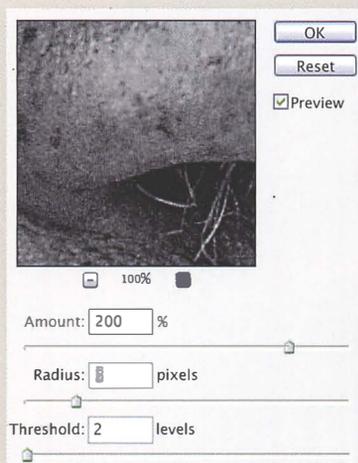


Above: Always keep sharpening on its own layer.

If you do need to resize your image, it can be best to create a temporary duplicate of your master file, resizing the image and sharpening it. This prevents you accidentally saving your changes, particularly resizing, to the master file. After you make your print, you can discard the duplicate file if you don't anticipate making further prints of that size in the future.

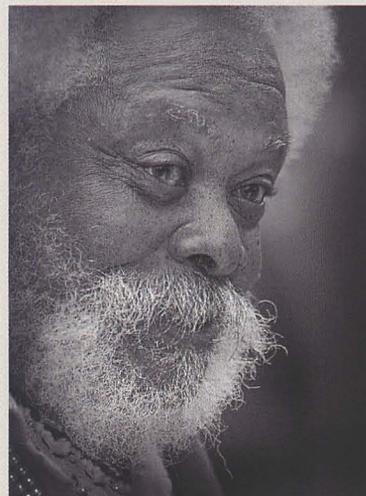


Above: Correct print sharpening looks unacceptably coarse on your monitor at 100%.



Above: A radius of 3 produces a print sharpening rim that is effective but not too obvious.

In general, it is best to work on a copy layer—again, the principle of working non-destructively applies. Hide any border or even text layers so that they don't get sharpened too, and then hold down the Alt/⌘ key as you select Merge Visible from the Layers palette. On this new sharpening layer, apply your preferred sharpening technique. A radius of 3 is generally good for 300dpi printing since it equates to 1/100 of an inch, and an amount of 150–200% is a good starting point.

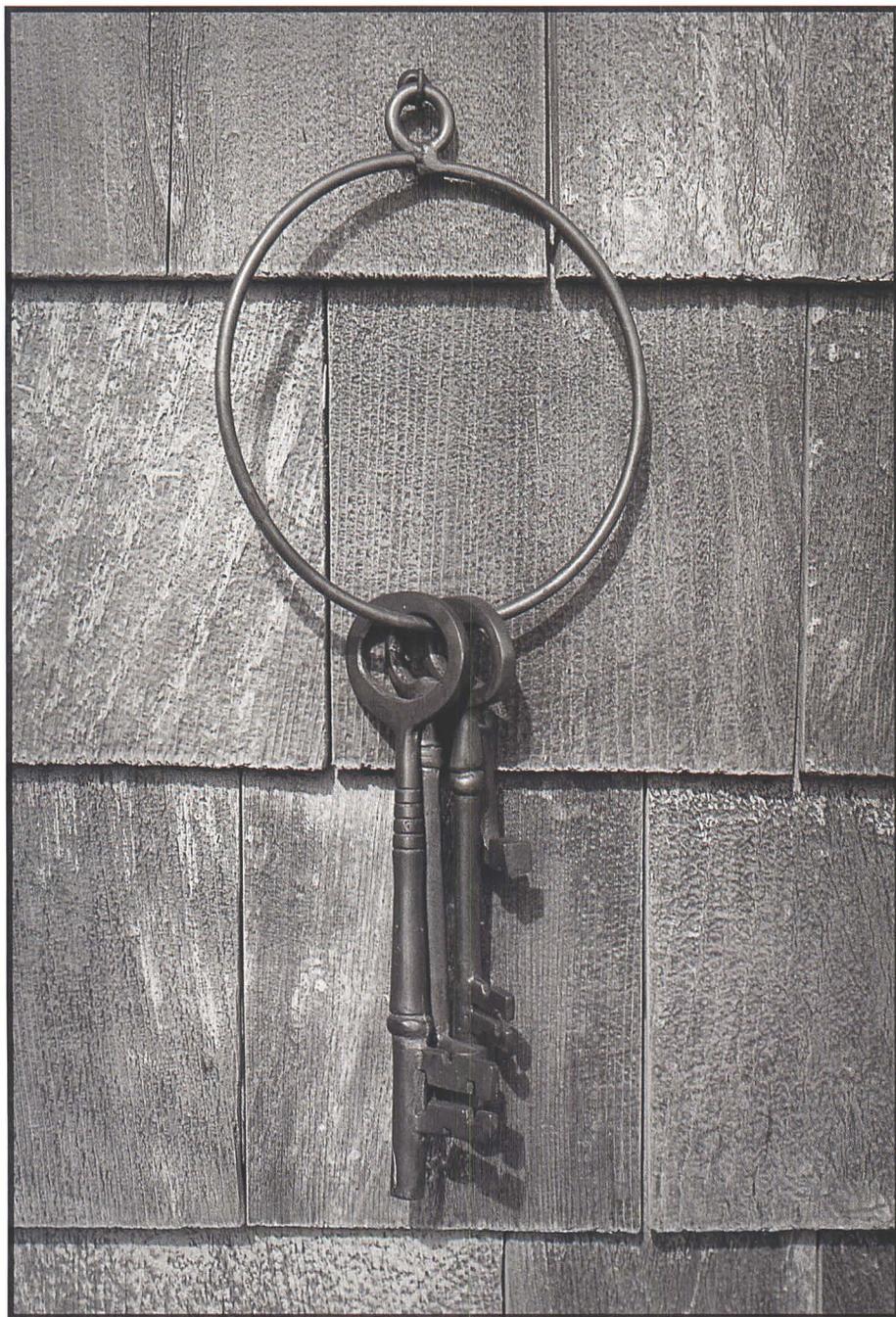


Above: Zoom out to 25–50% to examine sharpening's impact on the image.

You need to evaluate print sharpening by examining the print and not from the sharpening's on screen appearance. Your monitor has a lower output resolution than a printer and acceptable print sharpening usually looks brutal on a screen at 100%. It can help to zoom out to 25–50%, but even then you are still comparing apples with oranges—judge your sharpening by examining the final print itself.

# PRINTERS

The inkjet is by far the most common type of photographic printer and offers a great balance between quality and affordability. Manufacturers are continually updating their product ranges and it is difficult to keep up with the latest developments. Before buying, check reviews in photographic magazines and take advantage of the vast number of resources now available over the internet. Someone, somewhere will have already used the printer you are interested in, and will have posted an online review.

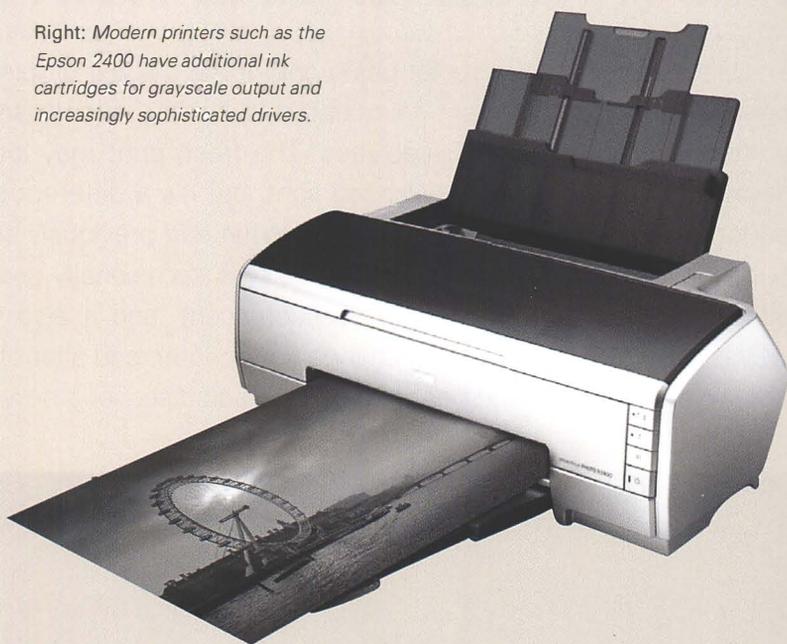


*Left: With the right paper, with proper black and white ink, the quality of today's printers enables you to digital prints that can rival the beauty of a fine darkroom print.*

## PRINTERS: INKJET

Almost any inkjet printer can print a photograph, but for decent quality you need to look at the models that manufacturers produce specifically for photographic printing. These are more expensive, but their output quality is much higher—as in so many things, you get what you pay for. Photographic inkjet printers have more colors, usually 6 or 8 and in separate cartridges, while standard inkjets often only have cyan, magenta, yellow, and black, all in a single cartridge which has to be replaced as soon as one color runs dry. With extra colors, the more expensive photo-quality printers offer better color rendition. Most manufacturers now include extra grayscale cartridges such as light black for better mono reproduction.

Right: Modern printers such as the Epson 2400 have additional ink cartridges for grayscale output and increasingly sophisticated drivers.



## PRINTERS: CONTINUOUS FLOW

Some printers can accept continuous flow systems. These are often from third-party suppliers, sometimes from the printer manufacturer, and usually consist of self-standing ink bottles with tubes connecting them to the inkjet cartridges. After an initial cost, running costs are much cheaper and even relatively modest printing volume can justify the outlay. One big advantage is that you can use specialized black-and-white inks which the printer manufacturer may not produce.

### TIP

*Archival longevity should also be a major consideration. The better photographic printers tend to have inks based on pigments which tend to be much less susceptible to fading than dye-based inks. This is a fast-moving area, so it pays to review the specifications carefully when deciding to buy a new printer.*



Above: Many printers can accept continuous flow systems. These can reduce ink costs considerably, but involve initial setup costs.

# NEUTRAL BLACK AND WHITE

There's a certain irony in color being one of the biggest problems of black-and-white digital printing, and it's important to maintain a healthy scepticism when reading about new printers' black-and-white capabilities. The fresh print may look fine when it is viewed in daylight or with a daylight-balanced light, but it's a different story once you see the print under regular tungsten house lighting. What had previously seemed pure black and white suddenly exhibits a magenta color cast, or is occasionally greenish. The unwanted tone is different when the light source is fluorescent, and it also varies greatly depending on which paper you use. You can change your printer, and a lot of other things too, but a lot of photographers make the best of a bad job and discover a new enthusiasm for split toning.



## SPLIT TONING

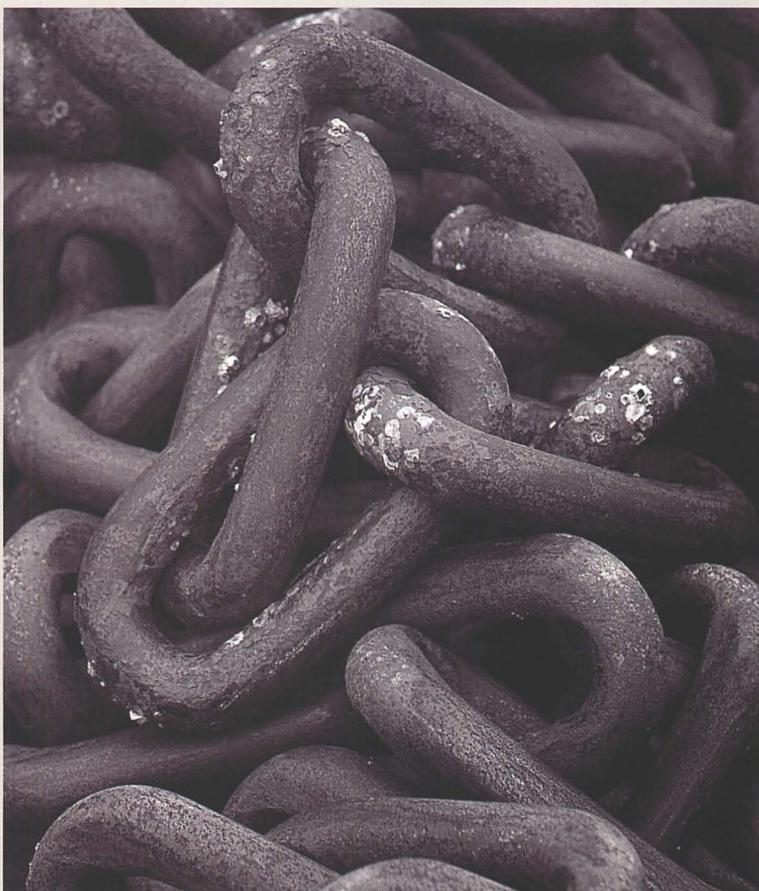
There's an underlying technical obstacle here. For a color inkjet printer, printing a toned or split-toned black-and-white image is little different from color printing as it can blend the tone from half a dozen color cartridges, and then add black from one or more grayscale inks. But printing a neutral black and white presents a problem, even for a top-of-the-range printer. One or two grayscale inks are not enough to produce a smooth tone. To balance this the colored inks are also used, and the printer driver tries to combine them in a balance that results in a neutralized (gray) color. The output may look right in daylight, but it's inevitably a compromise.

Things are getting better. Printer manufacturers are introducing third and fourth grayscale inks so less use has to be made of colored inks cartridges. Drivers are also improving, though those from printer manufacturers tend to cover only their own brand papers. Even then, manufacturers' claims need to be put to the test. Check the print under normal house lighting and a faint color cast is often visible.

Some photographers are happy with the mono output from third-party RIPs such as ImagePrint, QuadTone Rip, and QImage. These are replacements for the original printer drivers and have a range of specialist features like reducing ink usage, supporting a wider range of paper types, and print queuing. They also have black-and-white settings.

But opinions differ. I've only ever been really satisfied by using dedicated black-and-white ink sets. These are available from companies such as Piezography, Lyson, and Permajet and are replacement cartridges or continuous flow systems. At their simplest, one swaps the black and white cartridges in and out as needed, taping over their nozzles when not in use. Because there is no need to compromise and use color inks, the results are much more neutral—simply black and white.

*Opposite: Specialized inks produce the most neutral black-and-white results.*



*Above and Below: Specialized black and white inks are often based on carbon pigment and have carbon's warm undertone. They usually come in sets which let you add tonal variation.*



Warm neutral



Cool neutral



Neutral



Cool sepia

# CMYK OUTPUT

Commercial repro printing is a specialized and highly skilled field. For many photographers, the whole topic of CMYK, the four-color printing process used by most commercial presses, has the mysterious status of a black art. CMYK needs the picture to be separated into cyan, magenta, yellow, and black components, from which four printing plates are made and attached to the press's rollers. Each then applies the appropriate ink color as paper passes through the press. While the computer can do the RGB-to-CMYK calculation, the screen's RGB image contains a wider range, or gamut, of colors than the press can accurately reproduce. These out-of-gamut colors will be clipped. Alternatively, the RGB colors need to be adjusted before the CMYK separation.

That adjustment is usually made by the printer, not the photographer. Many pro photographers have never once been asked to submit CMYK-separated material, and that includes some acquaintances with 40 years' experience. They hand over their pictures in RGB form, and their publisher or printer handles all the CMYK issues. For the photographer to perform those tasks would involve a major transfer of commercial risk and responsibility. From the perspective of those running the presses, generally the last thing they would want would be non-experts submitting erroneous attempts at CMYK color separations.

While it is uncommon for the black-and-white photographer to handle CMYK separation and printing, Photoshop gives you a fair chance of doing a good job. It has a group of soft proofing tools that preview the gamut problems, so you can then decide exactly how the image's color range is compressed to remain within the range of colors that the printer can output. Any such work is usually best left to the very end of the

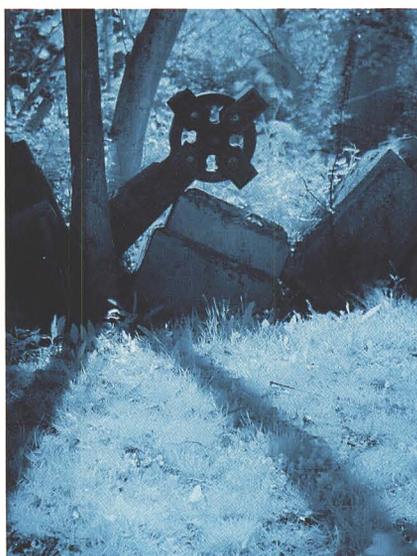
editing process since some familiar Photoshop features behave slightly differently in CMYK mode. So complete your regular editing work as normal, resizing the picture to its output dimensions and sharpening it, and save a master file in RGB format. Then prepare the CMYK version using a duplicate file.

When you are taking responsibility for something so critical, it is important to communicate with the printer

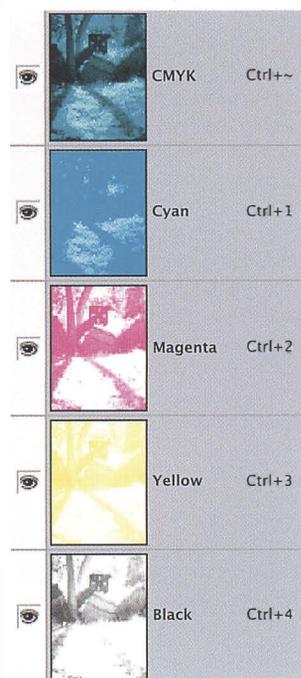
and keep proper documentation. Plan to submit both the RGB and the CMYK files, accompanied by an inkjet print for reference.

*Opposite: The final output stays sharp with manually adjusted CMYK channels for better definition of colors that were out of gamut after RGB conversion.*

*Below: CMYK separates the picture into cyan, magenta, yellow, and black components and is used in most commercial printing presses.*



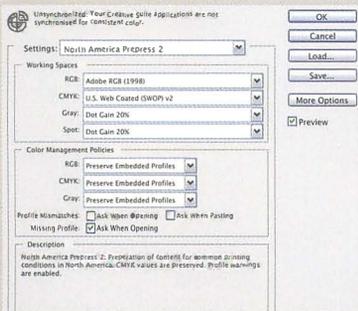
*Above: Conversion issues particularly affect toned images. This picture's strong cyanotype-style color is too bright to reproduce properly on a CMYK press.*



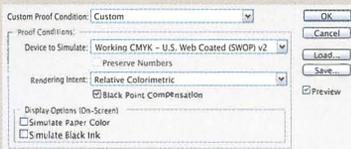


# CMYK OUTPUT

## COLOR MANAGED CONVERSIONS



**1** As with all advanced work, it is important to make sure your monitor is calibrated and profiled, and to set Photoshop's color settings so they are correct for the printing press. In the USA that would generally mean choosing North America Prepress 2, but this varies by country and it is best to seek written confirmation from the printers.



**2** To see if your RGB image contains any colors that are out of gamut, set up Photoshop's soft proofing for the specific type of press which will be used. While you can pick *View > Proof Setup* and then choose Working CMYK, a more sophisticated choice is Custom which lets you fine-tune the settings.

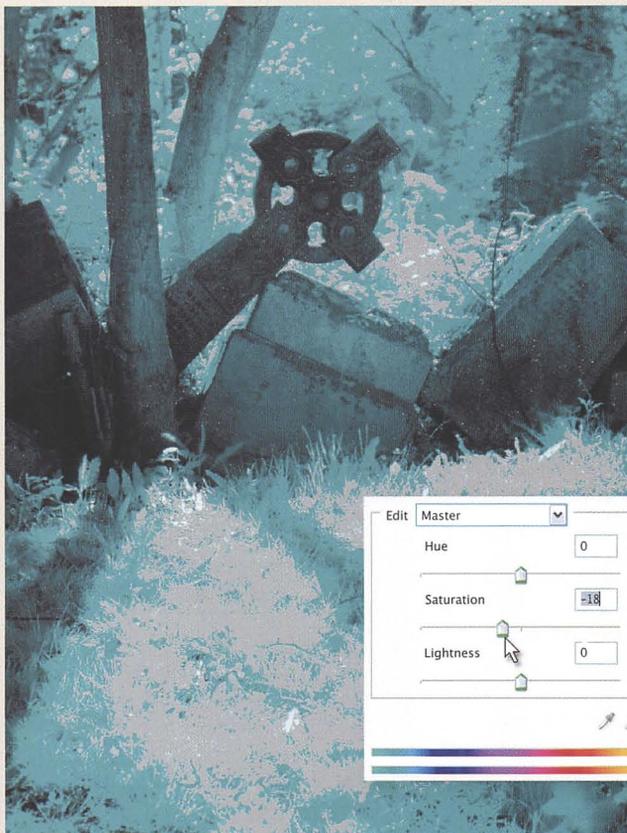
The Device to Simulate signifies the press type. SWOP or Standard Web Offset Press is one US standard, but you should place the responsibility on the printer to supply the correct profile for their equipment, especially if the printer uses sheet-fed presses. For Rendering Intent, choose Relative Colorimetric, which will clip any colors but preserve brightness values. Then make sure you save your settings.



**3** Switch on soft proofing by selecting *View > Proof Colors*, and switch on *View > Gamut Warning*. This enables a preview mode that shows what will happen to your RGB colors after you make the image CMYK. A gray overlay marks out-of-gamut areas.

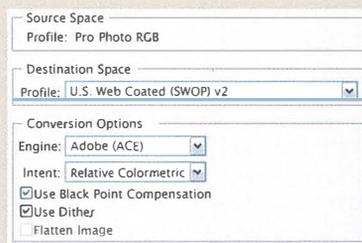
Above: Photoshop's Gamut Warning makes it very obvious when RGB colors are out of the CMYK press's gamut or printable range.

**4** With Photoshop's Gamut Warning active, you can add a Hue/Saturation adjustment layer and reduce the saturation while watching its effect on the RGB image's colors. Here I have begun to drag the overall or Master saturation to the left and this has reduced the out-of-gamut areas. The Edit drop-down box also lets you adjust individual colors, which may be useful if you are working with a split-toned picture. Alternatively, use a Selective Color adjustment layer.



**5** You can also target specific image areas with the color adjustments. Before adding the adjustment layer, go to *Select > Color Range* and pick Out Of Gamut. When you add an adjustment layer, it is automatically masked.

**6** The adjusted colors will not usually be as sparkling as in the original AdobeRGB or ProPhotoRGB image, but you should be able to adjust a toned black and white so that the colors are acceptable and can be reproduced on the CMYK press. Once you are satisfied with the soft proof, *Image > Mode > CMYK* is the quick way to make the CMYK version and applies Photoshop's current settings to the picture.



**7** For more control, choose *Edit > Convert to Profile*. This also lets you review the settings that will be applied. Generally one chooses Adobe (ACE) as the Engine and Relative Colorimetric as the Intent. Black Point Compensation should also be ticked so Photoshop matches the output black to the image's black. Allow Photoshop to flatten the image, make sure your copyright and content details are in the file, and save it as a standard TIFF.

# BLACK AND WHITE IN BULK

Most of this book has focused on making the best individual black-and-white image. “Best” is judged in terms of quality, and in terms of using the mono conversion creatively, so the final work has made the most of the captured image data and presents the best subjective interpretation of the subject. It is an approach suited to one-off jobs, and is perhaps indicative of a fine-art mentality.

## ACTIONS

But more and more photographers also want black and whites not just of the day’s best few shots, but of every frame worth keeping that day. Given how quickly some cameras can fill flash cards, the one-off, fine-art approach could amount to an awful lot of Photoshop time. Essentially there are five possible solutions:

- Shoot black-and-white RAW+JPEG
- Process color RAW files with a Photoshop Action
- Process color RAW files through a RAW converter
- Use a cataloging program to output in black and white
- Use new-generation combined cataloging and RAW processing programs such as Lightroom and Aperture.

For sheer efficiency, choose the RAW+JPEG shooting setting if your camera has one, and set it to black-and-white mode, too. Once the pictures are on your computer, all you then need to do is get all the pictures into one Finder or Explorer folder and sort them by file type. Of course, you will have to make this decision before you press the shutter release.

A Photoshop Action is a way of recording editing steps so they can later be replayed and applied to other images. To set up a black-and-white conversion Action, open an image and start a new Action in the Actions palette. Add a Black and White adjustment layer, a sharpening layer, and maybe a border, then save the file and close it. Click the Stop playing/recording

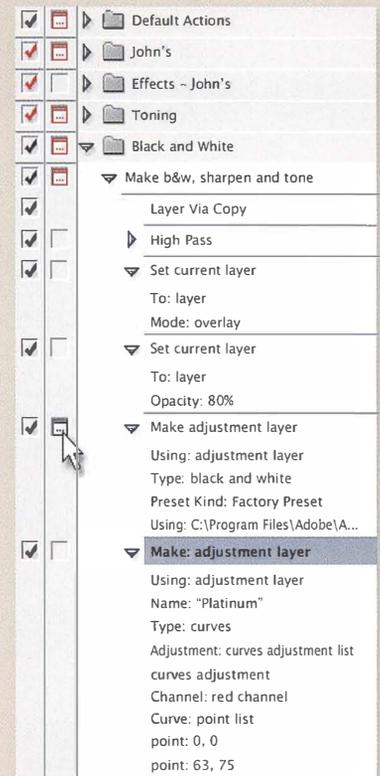


Above: A Photoshop action can add adjustment layers and be an efficient way to process lots of pictures consistently.

button in the Actions palette, and the Action is ready. You can now open the next color picture, run the Action, and proceed through all the images.

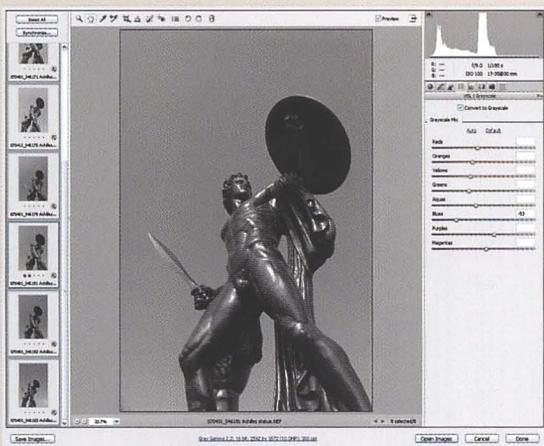
You could also introduce user input into the Action. For instance, tick the column to the left of the Black and White adjustment layer step, and the Action will pause each time it is run, enabling you to adjust the sliders to

Below: Actions let you replay your editing steps and can be paused for user input.



suit each image. Alternatively, if you simply want to leave the computer processing multiple images, you can select them in Bridge and set off the Action using the command *Tools > Photoshop > Image Processor*.

Photoshop Actions work well once you have set them up and tested them, and when your editing work involves little variation. Little things, like dealing



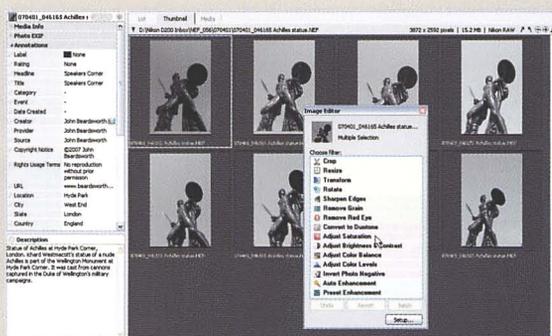
Above: Camera Raw's Stack Mode can work on many images at once.

differently with portrait and landscape format images, can prove awkward, even for photographers adept at automating their workflow. Others struggle and find Actions, let alone Photoshop scripting, a concept and discipline they never quite grasp.

Another approach is to use the RAW processor. This could be done equally well using Bibble, Nikon Capture, Capture One, or another standalone RAW converter, but it is quite easy in Bridge. Select the RAW files, then right-click and choose Open in Camera Raw. As we saw in the section on black-and-white conversion techniques, Adobe Camera Raw version 4 has a specific grayscale output option and accompanying sliders. You can select all the images and apply identical settings, or fine-tune each picture. Do not click Open, but choose Save, and you will be prompted for a folder and format for the output. When Items

Remaining has counted down to 0, click Cancel so that your black-and-white conversion settings do not overwrite any existing color RAW conversion settings.

Cataloging and photo-organizing programs can often output black-and-white from color images. In this category are consumer-oriented packages like iPhoto on the Mac and Picasa on the PC, and more pro level DAM (digital asset management) tools such as iView/Expression Media. These programs include basic controls for black-and-white output and special effects like sepia toning and vignetting. They may be geared more toward convenience than professional quality, but they're great if you are using them to manage and find your pictures and need a lot of black and whites in a hurry.



Above: iView Media Pro is a multimedia cataloging tool with photographic tools.





Above: In *Lightroom*, switch to *Auto Sync* mode to apply your adjustment to all the selected images.

Develop's sliders usually adjust only the picture that is currently shown on screen. To apply those adjustments to all selected images at once, press the Sync button. *Lightroom* lets you decide which adjustments to apply—for instance, you may not wish to apply the same crop or dust correction to all the pictures.

But there is an even more efficient way to work in Develop—hold down the **Ctrl/C** key and click the Sync button. This switches Develop into *Auto Sync* mode, which means your slider adjustments now apply to all selected images. I always work in this mode, selecting a sequence of similar images in the Filmstrip (F6), adjusting the sliders, then selecting the next group of pictures, and so on.

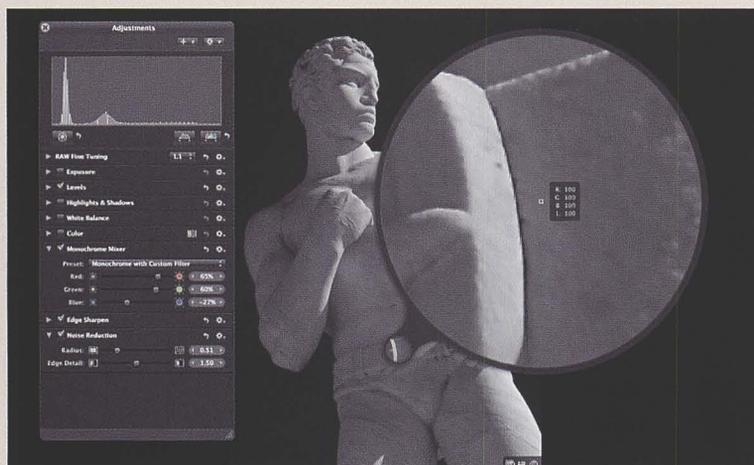
As well as fine-tuning black-and-white output, in *Lightroom* you can change contrast, sharpen, or apply split toning to multiple images. You can then send them all to the printer, burn them to a disc, or output them to the web.

Right: *Lightroom's* black-and-white conversions are applied to the entire picture. Individual shots must be sent to *Photoshop* if they need more than one conversion adjustment, or require dodging and burning.



# BLACK AND WHITE IN BULK

## APERTURE



Left: Apple's Aperture has a Monochrome Mixer that works like Photoshop's Channel Mixer.



Left: After fine-tuning one image, you can "lift and stamp" your adjustments to the others.

Apple's Aperture is also designed for adjusting the overall appearance of multiple pictures, not working Photoshop-style on one image at a time or manipulating images at pixel level.

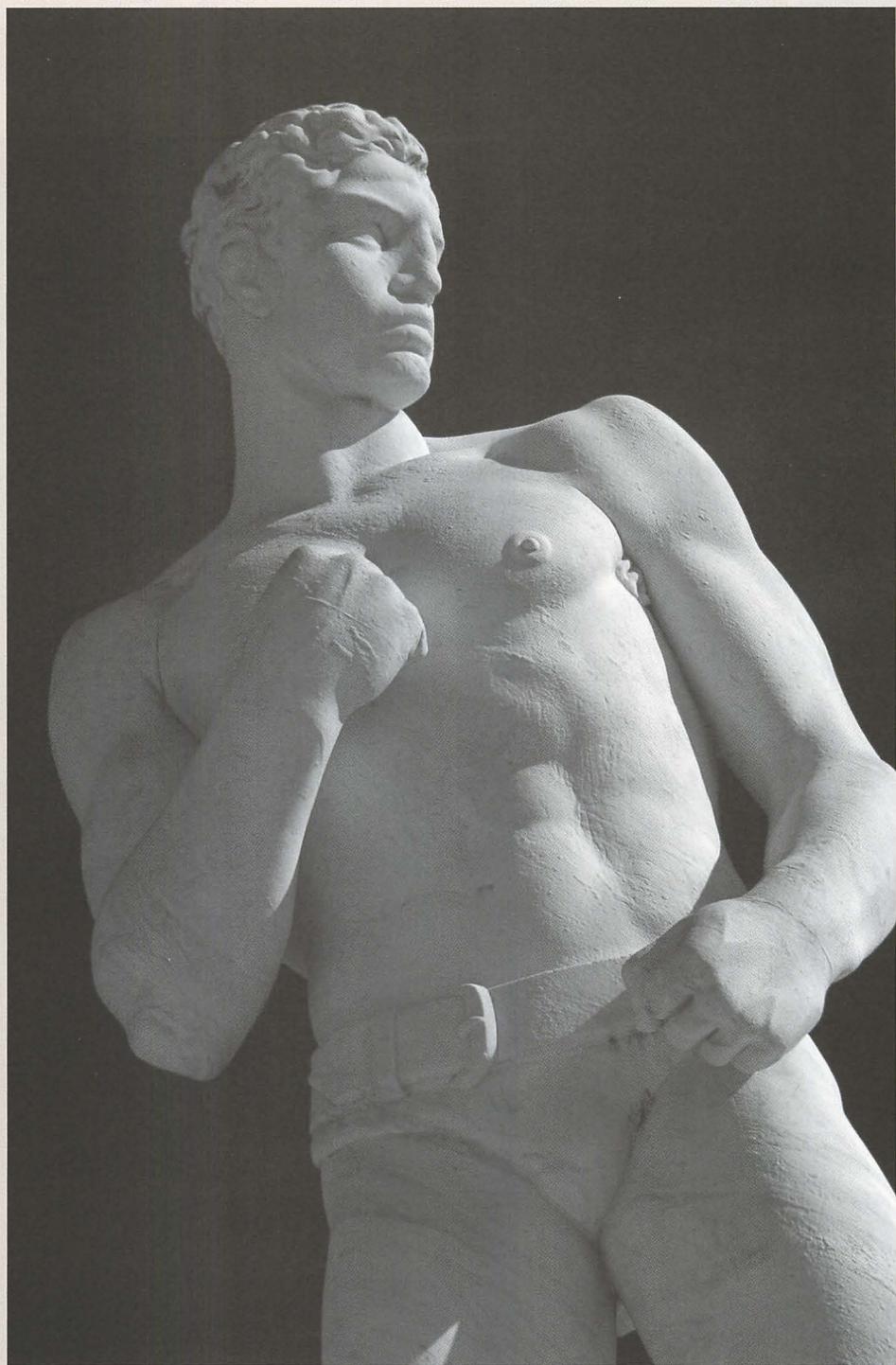
Like Adobe Lightroom, the Aperture workflow involves making virtual versions of your pictures. In the Browser view, select the thumbnails and choose *Image > Duplicate Version*. While Aperture automatically adds a version name, which will make it easier to find these new versions at a later date, it still makes sense to change the version name to something more useful, such as the master filename and a suffix. You can do this in *Metadata > Batch Change*.

Then display the Adjustments palette (^A) or go into full-screen mode (F) and bring up the Adjustments heads up display (H). From the palette or HUD menu, choose Monochrome Mixer and you have access to a set of sliders which work like Photoshop's Channel Mixer. You can apply negative values to one or more channel, but ideally the three sliders should add up to 100%. There is also a Color Monochrome adjustment so you can apply a single tone to the image, though there is no split-toning adjustment.

Once you have converted one image to black and white, you can apply those adjustments to multiple images using a Lift and Stamp tool, which works just like

regular copying and pasting. This needs to be done sensibly—the same mono conversion isn't right for every image—but it is very efficient for adjusting batches of pictures.

At the time of writing, Aperture's range of black-and-white controls is some distance behind Lightroom. But these programs are in direct competition and their features will develop quickly. Either application is already a viable option for bulk black-and-white work.

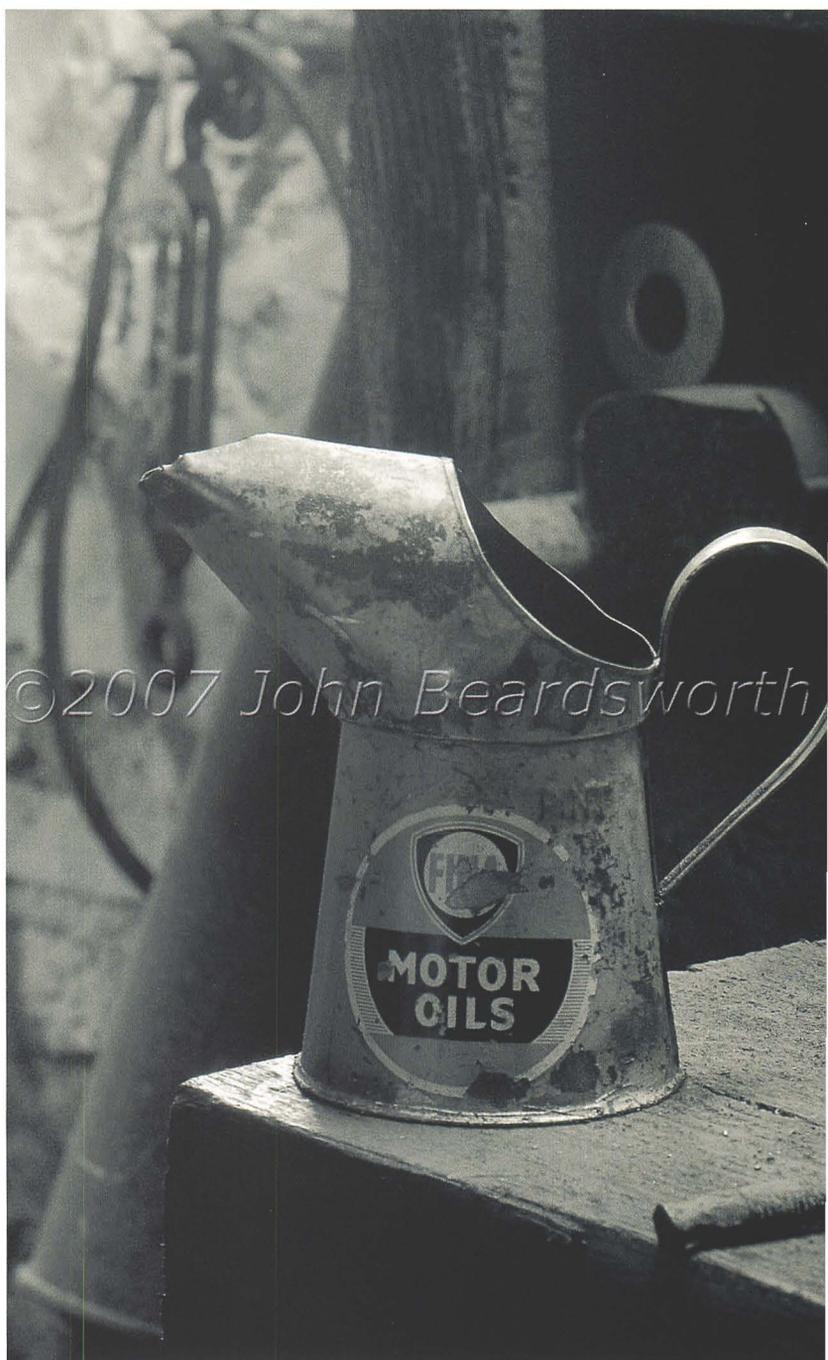


*Right: Aperture is ideal for producing high-quality black-and-white output and working with large numbers of pictures.*

# OUTPUT FOR THE WEB

The web is an increasingly popular means of displaying your work and there is a corresponding increase in the number of ways to do so. You can upload pictures to various photosharing and stock services, maintain your own site, or send pictures to a web designer. But regardless of which method you choose, you need to ensure your images look their best online, and make it as difficult as possible for people to steal your work.

Preparing images for the web should be done after completing all other work on a picture. So you don't overwrite the master file and lose all your adjustment layers, it can make a lot of sense to use a temporary duplicate for your web preparation work. Then resize the images, apply an appropriate level of sharpening, set a correct Color Profile, add a copyright logo, and last of all, check the pictures have the right metadata.



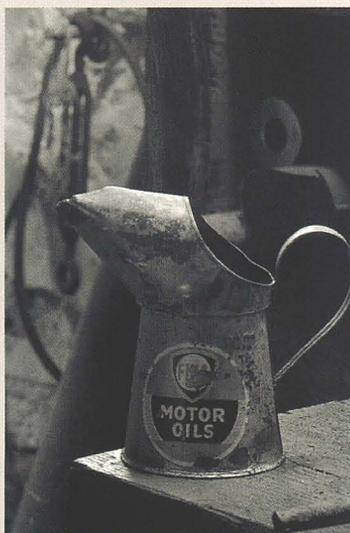
*Right: Include your name in your copyright watermark. It will take a copyright thief so much time to remove this notice that it will act as a deterrent. But be careful not to offend legitimate visitors.*

## SWITCH TO sRGB

When you're checking the pictures you've uploaded to your web site, you may notice that the colors look washed out in comparison to their original appearance in Photoshop. While this is not such a big issue for black and whites, it can still affect toned mono work. The reason for this is that web

*Below: Convert your images' color profile to sRGB before putting them online. Most web browsers are not color-managed and your visitors will see tones that are much less saturated.*

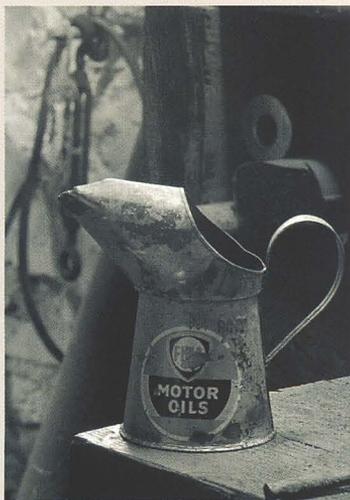
browsers are not color-managed (at the time of writing, the Mac-only Safari is the sole exception) so there is little point saving your ICC profile with the file and hoping that Safari is the only browser used to view your pictures. You need to allow for the lowest common denominator online, so choose *Edit > Convert to Profile* and switch your picture's color profile so sRGB. You may then need to adjust the color saturation, but this will ensure your site's visitors see your pictures at their best.



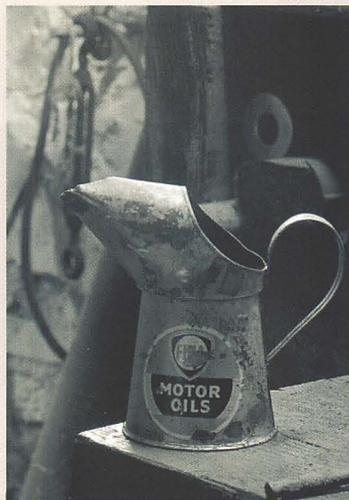
ProPhoto (in non-Safari browser)



sRGB (in non-Safari browser)



ProPhoto (in Safari)



sRGB (in Safari)

## HOW MANY PIXELS?

Until recently, the "right" size for the web made the best use of limited bandwidth and online storage space, but today the bigger considerations are the screen sizes which you expect your visitors will use to view your work, and the security of your pictures. You cannot assume that your visitors will only use 30 inch screens, or have the same-sized monitor as you. You need to target a much lower screen size and make web output no larger than 1000 pixels. Also remember that screens are wider than they are tall, and visitors to your web site should not need to scroll the browser to see the bottom of a picture in portrait format.

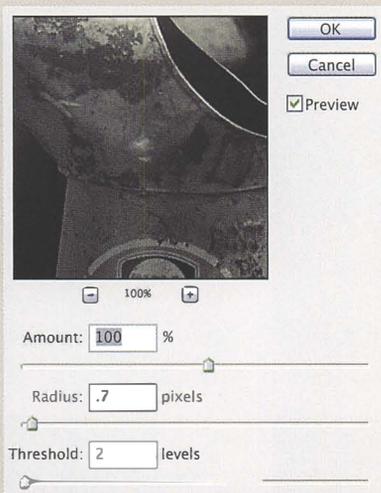
While you clearly want your work to impress, security is the other main reason for limiting the dimensions of web output. It is a common fallacy that Flash-based web sites protect your work better than HTML-based sites. A visitor can always take a screen grab (sometimes for legitimate reasons like shortlisting your pictures in a proposal). So, other than not putting work online, ultimately you cannot stop the determined thief. Instead, you need to increase his cost in terms of time and manual effort, and reduce the potential gains. So the smaller the image, the less useful it is to steal. At 600 pixels wide, someone could only make a decent 2 inch (5cm) print at 300 dpi, but the temptation obviously increases once you put larger images online.

# OUTPUT FOR THE WEB

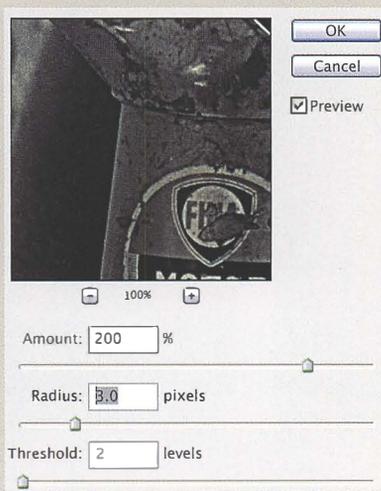
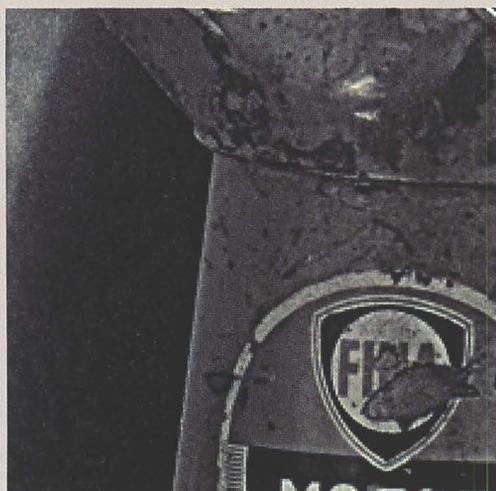
## SHARPEN THE IMAGE

After resizing the image and adding a border if required—but before you add any copyright notice—the next step is to sharpen the picture for web output. Unlike print sharpening, where the printer's different output resolution means sharpening often looks gruesome on screen, the output medium for web images is your visitor's monitor. So, broadly speaking, your own screen is fine for judging how much sharpening to apply for web use—just make sure you apply sharpening with Photoshop zoomed in to 100% or actual pixels. Set the Radius to below 1 pixel.

0.7 is good and at a typical 72 dpi monitor resolution roughly equates to 1/100 inch (0.25 mm) or the same-sized rim as for print sharpening. Also, if use the Unsharp Mask, make sure you immediately follow it with *Edit > Fade Unsharp Mask* and select Luminosity as the blending mode. This prevents any colored artifacts.



Left: Unlike sharpening for print, your monitor is a good guide for the final result online.

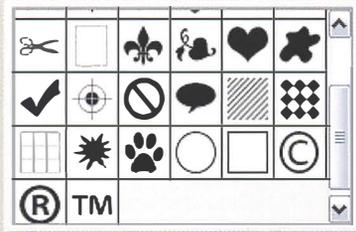


Left: Too much sharpening creates an unsightly halo around image edges.

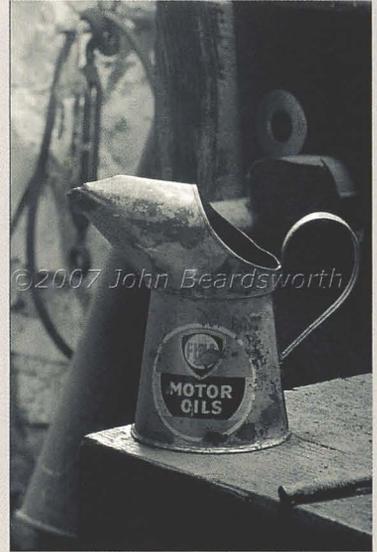
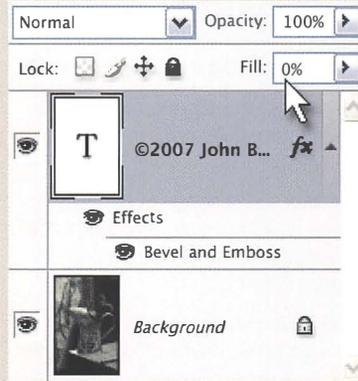
## ADD COPYRIGHT NOTICES

As well as limiting the size of your images, you should also add a visible copyright notice that includes your name. Its size is obviously a judgement call—you don't want to deface your work too much or treat all visitors as dishonest. But it needs to be obvious enough to stop legitimate users making mistakes and also deter casual copying.

Most of all, the larger the copyright notice, the more time the thief would need to spend Photoshopping it away. Again, it's a case of deterrence rather than complete protection.



Above: You can use one of Photoshop's built-in shapes for a copyright symbol.



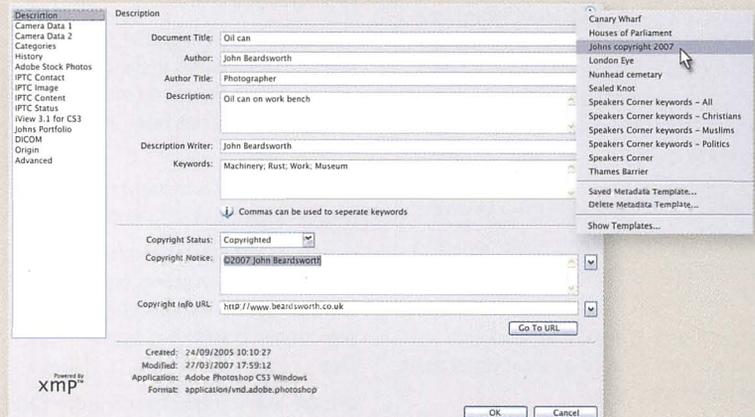
Left and Above: Use layer styles and reduce the Fill opacity to 0% for a neat transparent effect.

## ADD INVISIBLE METADATA

As well as adding a visible copyright notice to the image, you can take invisible measures to deter theft and prove your ownership of an image. Photoshop's *File > File Info* command lets you check that your images contain your copyright and contact metadata before you upload them. Ideally, such information would have been added when you transferred the pictures from your camera to your computer, using Bridge or a cataloging program, but in practice the information can easily get stripped away—by Photoshop's own Save for Web command, for instance. Instead, Photoshop's Save As command preserves metadata, but be aware that this includes camera-generated EXIF information such as the camera model, shutter speed, and other information that you may not wish to include.

It is best to do a final check using Photoshop's *File > File Info* command, and it is a good idea to set up a metadata template that contains your copyright and contact information. The determined thief can always remove these details, but at least you are tipping the cost/benefit balance in your favor.

Below: Photoshop's *File Info* panel lets you add invisible information about the picture. A determined copyright thief could remove this, but legitimate users of your work would not normally do so.



# GLOSSARY

**ACTION** Photoshop keystrokes recorded to automate routine activity.

**ADJUSTMENT LAYER** A layer in a Photoshop image that adjusts the appearance of layers beneath it, and keeps editing adjustments separate from image data.

**ALIASING** Jagged edges in a digital image, caused by the square shape of its constituent pixels.

**ALPHA CHANNEL** A grayscale version of the image that can be used with the color channels for saving a mask or selection.

**ANTI-ALIASING** Smoothing jagged edges by introducing additional pixels of intermediate tone.

**APPLE APERTURE** Image editor introduced in 2005 by Apple Computer and combining DAM features from cataloging programs and RAW image processing.

**ARTIFACT** Foreign shapes degrading a digital image as a result of its capture, manipulation, or output.

**BITMAP** An image consisting of a grid of tiny pixels, each with color and brightness values.

**BLENDING MODE** The calculation that controls how one Photoshop layer is composited with other layers.

**BLOWN OUT** Containing no detail, usually referring to overexposed parts of an image.

**BRIGHTNESS** Subjective impression of luminosity.

**BROWSER** A program that examines folders in real time, displays image files' thumbnails and large previews, and allows metadata entry. Searches are performed by examining the file system. Examples include Bridge, Photomechanic, Breezbrowser. Also used as shorthand for Web Browser.

**BURN** A photographic darkroom and Photoshop technique to darken part of the image.

**BURNT OUT** Containing no detail, usually referring to overexposed parts of an image.

**CATALOG** A program that records the contents of folders, displays image

files' thumbnails and large previews, and allows metadata entry. While folders may be shown, their contents are not updated in real time but only when instructed, and searches are performed upon the database. Examples include Extensis Portfolio, iView MediaPro, iMatch, and ACDSsee.

**CAMERA RAW** In Photoshop, the module responsible for converting RAW images from any digital camera.

**CHANNELS** The three colors whose brightness values are used to record the color of a pixel.

**CLIPPING** An absence of detail in image areas because the brightness values record either complete black or pure white.

**CMYK** Cyan Magenta Yellow Black—the subtractive model of defining color.

**COMPRESSION** Reduction of image size by use of algorithms to discard superfluous data.

**CONTINUOUS FLOW SYSTEM** A system of bottles and tubes that supplies ink to the printer.

**CONTRAST** Difference in brightness between neighboring areas.

**CURVES** In Photoshop, a method of mapping pixels' brightness values to the value at which they are output.

**DEPTH OF FIELD** The area in acceptable focus, in front of and behind the point at which the lens is focused, and varied by opening and closing the aperture.

**DERIVATIVE** An image file produced from an original, for instance the JPEG or PSD file saved after a RAW or DNG original has been edited in Photoshop.

**DESTRUCTIVE** Permanent change of pixels' brightness values or positions.

**DIGITAL ASSET MANAGEMENT** The practice of downloading, backing up, evaluating, describing, categorizing, selecting and archiving digital image files.

**DODGE** A photographic darkroom and Photoshop technique to lighten part of the image.

**DPI** Dots per inch, the standard measure of resolution.

**DYE** A type of ink that soaks into the paper.

**EXIF** Commonly refers to exposure information stored with digital image files; strictly refers to the file format.

**F-STOP** The ratio of the focal length to the aperture diameter, expressed as *f*2.8, *f*4 etc.

**FEATHERING** In Photoshop, making the edges of a selection softer.

**FILTER (PHOTO)** Transparent material which changes the light passing through it.

**FILTER (SOFTWARE)** A Photoshop adjustment to the brightness values of image pixels.

**FOCAL LENGTH** The distance between the center of the lens and the focal point.

**FOCAL POINT** The point at which light rays passing through a lens converge.

**FOCUS** Where light rays converge on the sensor and form a sharp image.

**GRADIENT** Smooth blending of one color to another.

**GRAYSCALE** An image containing pixels with brightness values only on a black-and-white scale and with no color data.

**HIGHLIGHT** The brightest tones in an image.

**HISTOGRAM** A chart showing how the distribution of pixels by brightness value.

**ICC PROFILE** A measure of a digital imaging device's color characteristics, used for accurate communication of color between devices. As set by the International Color Consortium.

**IMAGE MODE** Method of recording color and brightness in a digital image file.

**INTERPOLATION** The addition or deletion of pixels when Photoshop resizes an image.

**ISO** Measure of sensitivity to light ("speed") as set by the International Standards Organisation.

**JPEG** A digital image file format which compresses file size by the removal of unused color data.

**LASSO** A Photoshop tool to select image areas.

**LAYER** In Photoshop, a level of the image file to which changes can be independently applied.

**LCD** Liquid crystal diode, used to refer to the screen on the back of digital cameras.

**LIGHTROOM** Image editor introduced in 2006 by Adobe combining DAM features from cataloging programs and RAW image processing.

**LOSSY** A file format which discards image information to create a smaller output file. Opposite of lossless.

**LUMINOSITY** The quantity of light reflected by or emitted from a surface.

**MACRO** A type of lens capable of closeup photography at more than 1:1 magnification.

**MARQUEE** A Photoshop tool used to select image areas.

**MASKING** Blocking parts of an image from light, or in Photoshop excluding parts of layers from the composite image.

**MIDTONE** The average luminosity parts of a digital image.

**NEUTRAL DENSITY** Uniform density across the visible wavelength and of no color.

**NOISE** Random pixels on a digital image.

**PIGMENT** A type of ink consisting of particles that lie on top of the paper.

**PIXEL** Picture element, the smallest unit of a digital image.

**RAW FILE** The image data recorded by a digital camera's sensor in the camera maker's proprietary file format and containing the unchanged image data and one or more embedded JPEG thumbnails and previews.

**RESOLUTION** The level of detail in an image, measured in pixels or dots per inch.

**RGB** The primary colors of the additive model of recording color, used for recording image colors on monitors and in image editing.

**SATURATION** The purity of color, with high saturation being most intense.

**SELECTION** Part of a Photoshop layer selected by the user and marked by the "marching ants" dotted lines.

**SHADOWS** The darkest tones of an image.

**SHUTTER** Camera mechanism that controls the time that the sensor or film is exposed to light.

**SLR** A camera that shows the same image directly through the viewfinder as on the sensor or film.

**SMART FILTER** From Photoshop CS3, a filter applied to a Smart Object layer and altering its appearance. Unlike earlier uses of filters, its effect can be reversed or adjusted at any time.

**SMART OBJECT** A protected layer in Photoshop (CS2 onward) whose appearance may be adjusted or distorted without changing or losing the underlying image data.

**SOLARIZATION** Usually the same as Sabattier effect but strictly an effect caused by greatly overexposing film emulsion.

**SPLIT TONE** The addition of one or more tones to a monochrome image.

**STOP** See *f*stop, also used as the action of closing the aperture, as in "to stop down."

**TIFF** Tagged Image File Format, a file format for high-resolution graphics, widely compatible with other operating systems.

**UNSHARP MASK** A process which increases the apparent detail of an image by computer manipulation.

**WHITE BALANCE** Automatic compensation for the color temperature of artificial light.

## FURTHER READING

Ansel Adams *The Negative*

Ansel Adams *The Print*

Don McCullin *Sleeping with Ghosts*

Don McCullin *Unreasonable Behavior*

Patricia Morrisroe Mapplethorpe  
*A Biography*

Eddie Ephraums *Creative Elements*

John Paul Caponigro *Adobe Photoshop  
Masterclass*

Martin Evening *The Adobe Photoshop  
Book for Digital Photographers*

John Beardsworth *Lightroom  
Essentials*

## ONLINE RESOURCES

Adobe  
<http://www.adobe.com>

Russell Brown  
<http://www.russellbrown.com/>

Aperture  
<http://www.apple.com/aperture/>

Permajet  
<http://www.permajet.com/>

Lyson  
<http://www.lyson.com/>

Piezography  
<http://www.piezography.com/>

QuadTone RIP  
<http://www.quadtonerip.com/>

Heidelberg Druckmaschinen  
<http://www.heidelberg.com/>

# INDEX

- A4 size 166
- abstracts 164
- action photography 88
- actions 133–34, 136, 176–77
- Actions palette 136, 176
- Adams, Ansel 16, 22, 31, 70–71, 92, 96, 162
- adaptive adjustments 89
- Add Noise 139
- adjustment layers 40, 46–50, 52–55, 57–58, 61–62, 64–65, 68, 71, 73, 77, 83, 88, 90–92, 94–95, 97, 99, 101, 113–21, 123–25, 127, 130–31, 133–36, 141, 143, 147–49, 153, 163, 175–76, 178, 182
- Adjustments palette 180
- Adobe 25, 28, 37, 50, 58, 60–61, 88, 102, 139, 175, 177–78, 180
- AdobeRGB 175
- Advanced 104
- age 57, 68
- agitation technique 140
- Alien Skin 141
- Amount 85, 103–4
- anti-infrared filters 35
- Aperture 58, 176, 178, 180–81
- Apple 178, 180
- archiving 121, 169
- artifacts 31, 85, 103–4, 108, 184
- Auto Sync 179
- automatic exposure 12
- automatic settings 36
- background 55, 60, 88, 91, 99, 101, 131, 147, 161
- Background Layer 45, 50
- backup procedures 114
- bandwidth 183
- Batch Change 180
- best practice 40
- Bibble 58, 177
- 8-bit mode 108, 116–17, 131–32, 135, 146
- 16-bit mode 23, 28, 58, 131–32
- Bitmap mode 147–48
- black point 76–78, 146
- Black Point Compensation 175
- Black and White
  - adjustment 52–58, 64, 68, 71, 73, 113, 130, 133, 141, 176, 178
- Black/White Studio Pro 141
- bleeding 156
- blemishes 68
- Blend If 135–36, 153
- Blending 45
- blending modes 37, 43, 50, 65, 83, 90, 93, 95, 97, 103, 105, 113, 115, 121, 123, 126–27, 131, 133, 135, 139, 148, 153, 184
- Blending Options 125, 135–36, 153, 157
- blown highlights 26, 29, 138–39
- Blue channel 46–47, 49, 57, 67–68, 113, 115, 119–21, 123, 130
- blur 23, 104, 131, 142–43, 152–53
- bone structure 98
- borders 27, 156–59, 167, 176, 184
- bracketing 29, 32
- Bridge 61, 176–77, 185
- brightness 18, 22, 24, 27–28, 46, 49–50, 55, 57, 67, 72, 78–83, 87, 89–90, 94, 97, 99, 102–3, 109, 113, 115, 117, 119, 130, 135, 174
- Brown, Russell 50
- browsers 180, 183
- Brush 64, 93, 95, 124, 127, 139, 159
- Brushes palette 159
- Bulb shutter speed 35
- bulk images 176–81
- burning 27, 55, 71, 73, 90, 92–101, 117, 124, 143, 162–63, 179
- burnt-out highlights 24, 86
- Calculations command 44–46, 62
- calibration 174
- calligraphy 159
- Calotypes 122–23
- Camera Raw 25, 28, 37, 58–61, 88, 102, 139, 177
- camera shake 23
- Canon 35
- Canvas Size 157, 159
- Capture 58
- Capture One 58, 177
- Cartier-Bresson, Henri 16
- cartridges 169, 171
- cataloging programs 176–77, 185
- Channel Mixer 48–50, 68–69, 71, 76, 130, 180
- Channels palette 46, 49, 67, 119
- children 57, 69, 78, 108
- chlorophyll 128, 130
- classic tones 120–21
- clipping 20, 25, 27, 48, 77, 86–87, 172, 174
- cloning 27, 103, 143
- clouds 33–34, 36, 48, 82–83, 128, 143, 156, 163
- CMYK output 172–75
- Color Balance 114
- color casts 30, 35, 37, 170–71
- color channels 17, 31, 41, 43–44, 46–47
- Color Fill 43, 127
- color images 14–15
- Color Intensity 42
- Color Libraries 117
- color managed conversions 174–75, 183
- Color Monochrome 180
- Color Range 123, 131, 147–49, 172
- Color Sampler 118–19
- color settings 174
- color values 43
- colorizing 113, 126
- commercial repro printing 172
- compositing 44
- composition 16–18, 22, 27, 36, 46–50, 55–56, 66, 68, 71–72, 76, 92, 97, 101, 141, 164
- computers 14–15, 18, 23, 25, 28, 30, 44, 61, 114, 164, 172, 176
- contact information 185
- contact printing 122, 160
- contact strips 90–91
- content details 175
- Contiguous 109
- continuous flow printers 169, 171
- contrast 15, 18–19, 41, 49–50, 57, 66, 69, 76, 78–85, 90–91, 93–94, 97, 102–3, 105, 108, 113, 115, 117, 123, 134–37, 140, 146, 179
- contrast control filters 18
- convenience 12–13
- converging verticals 61
- conversion 15, 18, 28, 30–31, 40, 43–44, 46–49, 52–53, 58, 60–73, 76, 88, 91, 103, 113, 117, 124–25, 130, 133, 135, 141, 146–47, 150, 174–77, 180
- Convert to Grayscale 60
- Convert to Profile 175, 183
- copies 103, 109, 118, 131, 136, 141, 146, 152, 167, 178
- copyright 175, 182, 184–85
- Create Virtual Copies 178
- creative techniques 66–73, 86–87
- Crop 159
- cropping 27, 143, 160–61, 179
- cross-hatching 144, 147–49
- CS2 58
- CS3 52–53, 58, 61, 68, 77, 85, 105, 113, 116, 130, 132, 141, 152, 178
- cursor 52, 55–56, 64, 71, 73, 83, 87, 127, 130, 178
- Curve Display Options 117
- Curves 23, 27–28, 57, 68, 71, 73, 77, 79, 81, 83, 87–89, 92–95, 97, 99, 101, 113–15, 117–21, 123, 127, 133, 135–36, 143, 153, 163
- Custom 174
- cyanotype 112, 121
- dark corners 33, 143
- Darken 95, 97
- Darkness 146
- darkroom 14, 22, 26, 31, 38–109, 112, 114, 118, 120–21, 128, 132–34, 136–37, 150, 158, 164
- databases 178
- daylight 34, 170–71
- decorative borders 158–59
- dedicated ink sets 171

- default settings 53, 60, 65, 102, 117, 178
- Define Brush 159
- Define Pattern 147–48
- depth of field 36, 142
- Desaturate 41
- desaturation 40, 42, 67, 133
- destructive techniques 40–43, 67, 93, 102–3, 108–9, 116–18, 132, 136, 141, 167
- detail 20, 22, 26, 32, 48–49, 55, 77, 80, 88, 97, 126, 139, 143, 146, 150, 152
- Develop 178–79
- developers 140
- digital asset management (DAM) 177–79
- dilution ratio 140
- disk space 83
- documentation 172
- dodging 55, 71, 73, 90, 92–101, 117, 124, 143, 162–63
- drivers 168–69, 171
- Dry Media 159
- duotone 42, 67, 116–17
- duplicate files 167, 172, 182
- duplicate layers 49, 83, 85, 90, 93, 109, 116–17, 119, 147
- duplicate thumbnails 178
- Duplicate Versions 180
- Durer, Albrecht 144
- dust 179
- dynamic range 24, 28–29
- edge burning 101, 162–63
- edge drawings 146
- edge sharpening 108–9
- edges 27, 65, 83, 102, 108–9, 133, 156–57, 162–63
- Edit 175, 184
- Engine 175
- engravings 144, 147
- enlarger lights 90, 150
- Eraser 124, 131, 146
- EXIF information 185
- exposing to the right 20–23, 27–29
- exposure 20–24, 32–34, 36, 88, 90, 139, 142–43
- Exposure plug-in 141
- Expression Media 177
- Eyedropper 131
- eyepiece covers 36
- eyes 16, 40, 67–69, 93, 98–99, 102, 152, 164
- faces 47, 57, 69, 98, 101, 141
- Fade 104
- fashion 78
- Faux Finish 159
- feathering 109, 131
- feedback 20
- file formats 12, 176
- File Info 185
- file size 12
- fill flash 88
- fill light 28, 88
- film 20, 22, 24–25, 33–34, 48, 53, 71, 76, 138, 140–41, 161
- film and filter 50–51, 68
- Film Grain 131, 135, 139
- film rebates 160–61
- Filmstrip 179
- filters 12, 30–34, 48, 53, 56–58, 61–62, 65, 71, 73, 76, 84–85, 89, 91, 95, 105, 127, 132–33, 139–41, 143, 152
- Find Edges 133
- fine art 120, 134, 176
- fine contrast control 80–81
- fine-tuning 43–44, 46, 50, 58, 61, 67, 74–109, 119, 130, 134, 136, 152, 174, 177, 179
- flash 12, 25, 88, 183
- flash cards 176
- flattening images 175
- flattening layers 118–19, 146
- Flip Canvas Horizontal 147
- Flip Horizontally 164
- flipping images 164–65
- flowers 16
- fluorescent light 170
- focal points 60
- fog 97, 121
- foliage 30, 34, 113, 128, 130–31
- foreground 64, 91, 127, 131, 148–49
- four-color printing 172
- frames 27, 156, 161
- Fraser, Bruce 102, 166
- Frequency 147
- full screen mode 85
- Fuzziness 131, 148
- gamut 172, 174
- Gamut Warning 174–75
- Gaussian Blur 61, 65, 95, 104, 109, 131, 133, 139, 146, 152, 163
- gel/gelatine filters 32, 35
- glass filters 32, 35
- Gradient 64–65, 83, 91, 93, 95, 97, 99
- Gradient Map 41
- graduated filters 32
- grain 25, 128, 131, 134–36, 138–40
- graphic art 112, 122, 137
- grass 128
- grayscale 14–15, 17–18, 40, 46, 49–50, 53, 55, 62, 64, 66–69, 72, 76, 109, 116, 141, 169, 171, 177–78
- Grayscale mode 40, 62, 67, 73, 117, 119, 147–48, 178
- Green channel 46–47, 49, 62, 67–69, 113, 119, 121, 130, 135
- hairlines 98
- Halbert, Michael 144
- Halftone 148
- Halftone Screen 147
- halo effect 103, 166
- hand coloring 124–28
- hand holding 34
- hard drives 62
- Hard Light 105
- haze 33, 128
- heat emissions 34
- high key 78
- High Pass 104–5, 133, 157
- highlights 20, 22–29, 48, 57, 68, 78–81, 86, 88–89, 93, 97, 101, 104, 114–15, 119, 133–35, 138–39, 143, 149, 156
- histogram 19–23, 27, 36, 66, 77, 87
- history 40, 44
- History palette 43, 67, 105
- horizons 83, 97
- hot pixels 37
- HP5 140–41
- HTML 183
- Hue/Saturation 41, 50, 113, 125, 127, 175
- hyperlinks 61
- ICC profiles 183
- Image menu 44
- Image Processor 176
- image size 157, 183, 185
- Imagenomic 141
- ImagePrint 171
- Impressionism 150
- individual tonal range 81
- infrared 34–37, 128–31, 137
- infrared sandwich 37
- inkjet prints/printers 102, 106, 116, 166, 168–69, 171
- inks 117, 169, 171–72
- Intent 175
- internet 161, 168
- invisible metadata 185
- iPhoto 177
- ISO settings 12, 32, 86
- iView 177
- JPEG format 12–14, 30–31, 102, 106, 108, 161, 176
- keyboard shortcuts 27, 29, 46–48, 60, 64–65, 71, 77, 81, 83, 85, 93, 103, 109, 115, 125, 127, 131, 135, 139, 143, 146, 148–49, 153, 159, 161, 178–79
- Lab Color mode 43, 119
- lamplight 124
- landscapes 16, 18, 30, 32, 70–71, 78, 83, 91–92, 96–97, 100, 131, 138, 164, 177
- Lasso 95, 131
- Layer Set 148
- Layer Styles 125, 153
- layered method 146–49
- Layers palette 44–45, 49, 58, 61, 85, 93, 95, 103, 105, 125, 127, 152, 161, 163, 167
- LCD screen 18, 20–23, 35–36
- Lens 104
- lenses 32–35, 71, 140–42
- Letter size 166

# INDEX

- lettering 164
- Levels 23, 27–28, 65, 68, 73, 77, 79, 109, 127, 133, 146, 153, 159
- library software 178–79
- Lift and Stamp 180
- light-sensitive cells 31
- lightboxes 140
- Lighten 95, 97
- lighting 20, 33–34, 170–71
- Lightness 43, 49–50, 62, 67
- Lightroom 58, 176, 178–80
- Line 147
- line drawings 144–49
- Lith printing 36, 128, 134–37
- lithographs 112, 149
- Load 117
- local contrast 84–85
- logos 182
- lossy compression 12
- low key 150
- luminosity 25, 41, 86, 103, 135, 184
- Lyson 171
- M curve 133
- McCullin, Don 92, 138
- McCurry, Steve 16
- Macs 141, 177–78, 183
- Magic Wand 109
- manual exposure 35
- manuals 35
- manufacturers 168–69, 171
- Mapplethorpe, Robert 16
- Marquee 95, 143, 163
- masks 28, 40, 48–49, 55, 62, 64–65, 68, 71, 73, 83, 88, 91–95, 97, 99, 101, 109, 113, 116–17, 124, 127, 130–31, 139, 141, 143, 148–49, 161
- Match Color 42, 118
- matte 156
- measured tone 118–19
- memory cards 12, 14
- men 58, 69, 98–99
- Merge Visible 85, 103, 132, 167
- metadata 180, 182, 185
- metering 29, 33
- midtone 15, 28, 57, 78–81, 97, 99, 114–15, 119, 133, 135, 143, 149, 163
- mist 33–34
- mode options 13
- monitors 17, 166–67, 174, 183–84
- mono films 140
- monochrome 12, 16, 41–42, 49–50, 64, 68, 92, 112
- Monochrome Mixer 180
- Motion filter 104
- motion blur 32, 104, 142–43
- mounts 27, 156, 164
- mouse button 55
- multiple images 176–80
- Multiply 83, 90, 123, 133, 139, 148
- nanometers 35
- The Negative 31
- neutral black and white 170–71
- neutral density filters 32–33
- neutral graduated filters 32, 97
- night vision 34
- Nikon 35, 58
- Nikon Capture 177
- Noise 22–23, 25, 86, 108, 138–39
- NoiseAware 25
- NoiseNinja 25
- North America Prepress 2 174
- nudes 16
- one-off jobs 158, 176
- Open Object 61
- optical blur 104
- out-of-gamut areas 174–75
- output 154–85
- output sharpening 102, 166–67
- overexposure 20, 23, 32
- Overlay 92–93, 105, 131, 133, 135
- palladium 120
- PanF 140
- paper 27, 76, 82, 90, 120–23, 134, 140, 156, 168–71
- partial conversion 124
- partial tone reversal 132–33
- patterns 48, 144, 147–49, 159
- PCs 141, 177–78
- pens 52
- people 66–69
- Permajet 171
- Photocopy 146, 148–49
- photojournalism 78, 92
- Photomerge 29
- photorealism 144–49
- photosharing services 182
- Photoshop 14, 21, 25, 28–29, 32, 34–35, 37, 40–41, 44–46, 49, 52–53, 55, 57–58, 61–62, 64, 66–68, 71, 77, 81, 85, 87, 89, 93–94, 101, 103, 105, 109, 112–14, 116, 118–19, 122–23, 126, 128, 130–32, 134–37, 140–41, 144, 146, 148, 152, 156, 158–61, 172, 174–76, 178, 180, 183–85
- Photoshop Action 176–77
- Picasa 177
- Piezography 171
- pigments 169
- pinhole cameras 142–43
- pixels 183–84
- plan-do-review cycle 36
- plane of movement 143
- plastic filters 32
- platinum 120
- plug-ins 25, 58, 140–41, 144, 157
- Point Sample 119
- pointillism 138
- polarizing filters 32–33
- Polaroids 20
- portraits 57–58, 69, 98–99, 138, 150, 164, 177, 183
- post processing 22–23, 27–28, 35, 88
- posterization 23, 28, 91
- Power Retouche 141
- Preferences 46
- presentation 154–85
- presets 12, 35, 53, 56–57, 68–69, 71, 73, 91, 113–14, 117, 130, 141, 147, 159, 178
- previews 14, 45, 49, 53, 60, 65, 131, 172, 174
- primary colors 112
- printers 166, 168–71, 179
- printing 170
- prints 102–3, 105, 114, 116, 118, 121–24, 128, 132, 136, 150, 158, 164, 166–67, 170–72, 184
- profiles 174, 182
- Proof Setup 174
- proofing 172, 174–75
- ProPhotoRGB 175
- publishers 172
- QImage 171
- QuadTone 116
- QuadTone Rip 171
- queuing 171
- Quick Develop 178
- Quick Mask 109, 163
- Radius 85, 103–5, 184
- rasterizing 149
- RAW+JPEG shooting setting 176
- RAW format 12–15, 22, 25, 28, 30–31, 58, 60–61, 88, 102, 176, 178–79
- RAW processors 176–77
- Ray, Man 132
- RealGrain 141
- rebates 160–61
- recording in action 133–34, 136
- rectangular format 156
- Red channel 46–47, 49, 62, 67–69, 113, 115, 119–21, 123, 130, 135
- reference prints 172
- reflections 33
- regrouping 28
- Relative Colorimetric 174–75
- remote controls 35
- Remove 104
- Renaissance 144
- Rendering Intent 174
- replacement cartridges 171
- reportage 78, 100–101, 138
- repro printing 172
- resin filters 32
- resizing 123, 161, 166–67, 172, 182–84
- resolution 102, 138, 147, 161, 167, 184
- retouching 44–45, 58, 103
- reviews 27, 36, 168–69, 175