

What I've learned the hard way about digital imaging

It's important to me to understand as much of the photographic process as I can, so I know what I'm doing technically – on the other hand, I know from bitter experience that it's possible to get extremely bogged down in technicalities that don't contribute nearly as much to exciting images as my enjoying the whole process and playing with it do. These are some of the issues that have pulled me up short as I've been learning, and my hope is that there may be something here that'll save you some angst: there's no point in all of us having to invent the wheel!

NB I'm sharing my best understanding of these issues – but I'm absolutely not an expert.

My workflow

My computer set-up consists of a Power Mac G5 (1.8 dual processors) with 3.5 GB RAM running OS10.4.11; an LG 19in LCD screen; two external hard drives for back-up (one lives off-site); a Minolta DiMage Scan Elite 5400 film scanner; an Epson Stylus 2100 printer (plus a Stylus C84 for printing text and photo cards, etc.); and an Epson flatbed scanner I haven't yet used. I have SilverFast Ai to drive the scanner (but see below); Lightroom 1.3; and Adobe Creative Suite 3 (for Photoshop and InDesign). I have two digital cameras: a Nikon D200 and a Canon Powershot G6.

My workflow is:

1. Import digital captures and scans into Lightroom. With

digital captures, do an initial sort-out and throw the rejects away; rename according to my filing system. (I organize my images by month–year–location–image number, so for example a shot taken at Lake Vyrnwy in November 2006 would be 1106VYR001. This echoes how I used to file my slides, and how I’m most likely to look for images – by season or month and then by location.)

2. Back up to external hard drive (I aim to do this at the end of any session where I’ve worked on pictures, but especially when I’ve downloaded a card from my camera).

3. Do global edits in Lightroom – cropping, exposure, white balance, saturation and colour tweaks, noise reduction and sharpening (unless the image demands localized sharpening and blurring), and negative vignetting to darken the edges (unless this too needs to be done more selectively).

4. Export image to Photoshop as a .psd file (16 bit, ProPhoto colour space).

5. Do any localized edits in Photoshop, using adjustment layers and layer masks. If selective sharpening is necessary, do a rough selection of the area and dup those pixels, run Unsharp Mask, and then fine-tune the area that’s sharpened via a layer mask. At this stage, the file is ready for posting on the web (via Lightroom’s Web module).

6. Print, using Photoshop’s gamut warning and soft proof preview (see below). I may need to add extra colour or exposure adjustments; and extra sharpening, especially if I’m making an A3 print (I’ll do this on a duplicate layer that can be switched on and off).

Colour Management

OK – this is the area where I’m least confident. I keep thinking I’ve finally grasped it, and then the whole thing twists and gets away from me again. The following is what I think I understand right now.

Colour management is a way of translating colours between different devices. Your film scanner, monitor and printer, for example, all have different colour gamuts, which include and exclude different colours. I start my colour management in Photoshop (actually in Bridge, with CS3, where you set up colour management for the whole of Creative Suite), and I’ve cribbed my settings from Martin Evening’s books on Photoshop. On his recommendation, I’ve recently changed my RGB colour space from Adobe 1998 to ProPhoto, which is a larger colour space and closest to the hidden colour settings that Lightroom uses. I’ve set Photoshop up to alert me whenever I open an image with no profile (e.g. from my compact digital camera) or whose profile doesn’t match the current colour space (all my images processed in Adobe 1998 RGB). I usually choose to keep the old profile, which means that for that image I’m working in the old colour space (one of the many things that confused me in the past was that I didn’t realize that ‘profile’ and ‘colour space’ were the same thing).

Monitor calibration

On my old computer I used ColorSync and did this by eye, because calibration tools were then too expensive for home use. It works a lot better now, using ColorVision’s Spyder (I gave it a go by eye on this machine and there’s no comparison). I use the standard gamma of 2.2 (I used 1.8 for years because all the books said that was the one for a Mac,

but it turns out it related to some long-obsolete Apple printer and is completely irrelevant now); and a white point of 6500K. On Martin Evening's recommendation, I tried using my LCD monitor's native white point instead, but that sent colours off. My monitor has controls for setting things like white point, so maybe that's why this recommendation didn't work for me.

I recalibrate my LCD screen every couple of months, although there seems to be little change. I learned the hard way that CRT screens are unusable for colour work after about three years – suddenly I found all my prints were like brown soup, and this turned out to be because the CRT's colours had veered off and no amount of calibration could put my on-screen colours anywhere near what a print would be.

Camera colour space

When I got my D200, I carefully set the colour space to Adobe 1998 (the other choice is the smaller sRGB space). However, Lightroom ignores this: it keeps raw files in its own colour space, which is apparently close to ProPhoto but a bit bigger. This is a good thing, because it means you keep the maximum amount of colour information captured by the camera, which may come in handy in the future when printer gamuts (for example) may be larger than they are now. If you attach a profile that covers a smaller colour space than your camera captured, you're permanently discarding the colours that don't fit the smaller gamut.

Scanning and calibration/colour management

I've also just had a revelation about scanning (although I haven't yet been able to check this theory in practice): I was

keen to be able to calibrate my film scanner (i.e. create a profile for it), but have just learned that this means that you'll also be discarding some colour information that the scanner has captured. (So it seems that in this case a scanner profile wouldn't just describe the gamut of the scanner, but actually a rather smaller colour space, which I hadn't anticipated.) Calibration would make your workflow simpler in some ways, I think, but I'm excited by the idea of making a 'raw' scan, with no colour management, and then processing this in Lightroom. I think I should be able to then create presets to apply to subsequent scans (certainly for particular films), and I'll be a lot happier working in Lightroom than in SilverFast Ai, which I bought in the hope of making film scanning easier, but which turns out to be German and to have a manual written by someone for whom English is obviously a second language (add that to the usual manual jargon, and you've a recipe for headaches). Processing in Lightroom, of course, also means that my edits are non-destructive; so I can archive my original scan with my Lightroom edits and always go back to it later and reprocess it if changing technology (or improving expertise) means I could then get better results by doing things differently.

White balance

I've had various philosophical tussles with myself over this. To start with, I was very frustrated that the LCD screen on the D200 wasn't colour accurate – since most of my photographs are composed around colour contrasts and harmonies, this made the preview less than useful. I got diverted into switching to the sRGB colour space, trying different colour modes and more vivid saturation, in an effort to get the preview to match the scene more closely,

but all this led to more work undoing all these changes post-capture (since on the computer my original preferences produced the most accurate results). These other choices would have really messed up any JPEGs I happened to shoot (since they would have been irrevocably applied in-camera, unlike the more flexible raw format). So I've left the camera on Adobe 1998, mode III colour and normal saturation, and resigned myself to inaccurate previews. When I'm on a trip, and need to delete rejects by reviewing them on the D200's screen, I concentrate on composition and sharpness and do my best not to be distracted by colour considerations.

I contemplated buying a hand-held meter for a while, since I assumed that would give me a colour temperature reading (I can set white balance on the D200 in degrees Kelvin) – but apparently not. I realize you can use a grey card or white balance 'filter' to take a reading, but as I'm constantly moving round for different perspectives on a subject, which will have different colours reflected on different sides from the various plants, walls, etc. around it, and from its different angles to the sun, I don't think it would be worth all that fiddling around. In any case, although I'm usually attracted to a subject first by its colours, many of my favourite film shots have quite inaccurate colours – and in fact this was quite normal with film. So now I'm relaxed about shooting with auto white balance (AWB) and then playing around post-capture until I have a colour balance I'm happy with – one that brings the picture alive.

Exposure considerations

The nature of digital capture means that far less information is captured in the shadows than the bright tones, so

underexposure quickly becomes a big problem, losing detail in the shadows.

It turns out that the histogram, that you need to check to see that you're not losing exposure information unnecessarily, actually represents what a JPEG version of the image would look like, even if you're shooting raw. However, I gather that it's still a pretty good guide, although I won't necessarily delete captures that look as if they've lost some highlight detail in future. The problem is that with digital, in order to capture the maximum amount of high-quality information, you really want your image data as far to the right on the histogram as possible, without of course losing your highlight detail off a cliff at the right edge. If you underexpose (as I'm used to doing with transparency film), you'll end up with noisy shadows.

(Don't, by the way, rely on what the image looks like in playback – you really need to get used to reading histograms if you're not doing that already: they're just a graphical representation of the data in your image, with shadow information at the left and highlight information at the right; if the information butts up against the edge of the graph, it means it's recorded as pure black or pure white, so if that's not how you want your image to look you need to alter your exposure.)

Obviously, if you're shooting JPEGs, you really want the initial exposure to be as accurate as possible; but with raw you'll be able to change the exposure post-capture, as long as you've recorded the data in the first place (and not covered it with hundreds-and-thousands by underexposing your dark midtones and shadows). So my new good habit is to bracket towards overexposure rather than underexposure. And

maybe lust a little after the new Nikon D300 (not the D3 because it's too heavy), which looks as if it's much improved shots taken at high ISOs – so there's less temptation to underexpose a little to enable a hand-held shot. (I'm full of bad habits!)

Shooting raw

I love this way of working, and I think it's a natural choice for any photographer used to the fine exposure control of slide film. The absolutely brilliant thing about raw is that I no longer have to bracket in a third of a stop increments – I can tweak the exposure post-capture: oh, the relief of not being afraid of getting it wrong! As long as you've captured the information (see 'Exposure considerations', above), you can change the exposure by as much as a stop or more. And, of course, you can choose whatever white balance you like.

The big drawback of raw is the software confusion. Every camera manufacturer encodes the raw files for each new camera differently, presumably because they want to force you to buy their own software in order to read the files. This means that whenever you buy a new camera, you're liable to the additional (considerable) expense of upgrading your software in order to read its files. When I bought my Nikon D200, I had Photoshop Creative Suite, which I'd bought two years before. I therefore couldn't edit the D200's files with Photoshop, although Nikon did supply a plug-in that enabled me to view them. I decided to invest in their new Capture NX program rather than upgrading Photoshop, but found it completely inadequate for assessing pictures on initial import. Capture's previews were no larger than my camera's LCD screen, and it took a minute or more to open a file – which meant two hours for a cardful of raw captures!

I decided to use Photoshop's file browser instead, which gave me large previews (although I still couldn't zoom in at 100%, and the colour was inaccurate). This was OK until I tried adding IPTC metadata, whereupon Capture refused to open the files. I ended up with an extremely cumbersome workflow, which is why I've migrated to Lightroom, even though I did like the way Capture displays all my camera information, including exposure compensation.

So: do not assume you'll be able to use more than one program to work on your files – you need one that'll allow you to sort them out, add caption info and rename them; and then do your raw conversions, without having to tear your hair out thinking you've suddenly lost scores of pictures. There's probably no way round the expense of upgrading your computer software when you buy a new camera, though – you'll need the latest version of whatever raw converter you decide on in order for it to be able to read the files from your new camera. It's a racket!

Camera settings and raw

I spent ages when I first got my Nikon D200 setting up the colour space, colour mode, saturation, sharpening, etc. It's only since I've switched from using Nikon's own raw converter (Capture NX) that I realize that all these settings are irrelevant to all other raw converters. Lightroom, for example, only reads the D200's ISO and white balance settings for each shot – everything else is ignored. It applies its own defaults so that the image looks good from the start (if you zero all the settings – there's a preset that does this – each image will appear so flat and dull that it'd be impossible to make an initial assessment of which are keepers). You can set up your own defaults and apply them on import instead,

if you prefer; and of course you'll normally edit all these settings when you come to process the image (just as I did in Nikon Capture, which started with the settings I'd chosen via the camera menus, plus a few hidden extras of its own).

I've kept my camera on my chosen settings, though, for any occasions when I may want to shoot a JPEG, when of course they're important, since they determine how the data will be processed in-camera. (I presume they also affect what kind of histogram is generated for all your images – see 'Exposure considerations', above – although I don't know quite what to do with this idea, except perhaps to stick to my not-so-contrasty or -saturated choices for the settings.)

Photoshop

This is a notoriously complicated piece of software: it seems as if there are at least half a dozen different ways you can do anything with it, which makes the learning curve really steep. For cutting through this jungle, I highly recommend Rob Sheppard/*Landscape and Nature Photography with Photoshop CS2* (2006), even if you're using a different version of Photoshop. He's got me into a much more confident workflow, and it is wonderful how you can control precisely where and to what extent your changes get applied to an image by painting in layer masks linked to adjustment layers. I frequently want to limit sharpening to a very small area of the picture, or to darken a few scattered highlights, for example.

Printing

The orange-red-purple area of the spectrum is especially liable to be out-of-gamut when you print to an inkjet. I notice Epson have brought out new printers with more ink

colours – red, blue, orange – so I hope when I next have to upgrade my set-up I'll be able to make better prints. It's always worth doing a trial print even if there's a gamut warning – it'll sometimes work anyway, or at least produce the best result you can get. I'm hoping Lightroom's Vibrance slider, which increases saturation more on under-saturated colours than on saturated ones, will help me control over-saturated colours better. (The 'saturation' sliders in Lightroom's HSL panel are also really vibrance sliders, giving you control over individual colours.)

I've set up 'proof set-ups' for the printer/paper/rendering intent combinations I could choose from. In Photoshop, I go to View/Proof set-up and choose one of these to preview which areas are likely to be problematic as Photoshop (or my printer driver) translates from RGB to CMYK. (Photoshop's gamut warning works with this proof set-up to show you which areas of the image are beyond the printer's gamut, which is also helpful.) NB even though your printer prints in CMYK, you feed it the file in RGB. If you ask Photoshop to colour manage (in the print dialogue), that'll do the translation; or if you choose your printer driver instead, that will. I sometimes find that within Photoshop's colour management, choosing a different rendering intent (either Perceptual or Relative Colormetric) can make a difference to a print; and sometimes Epson's printer driver will do the best job. I've also learned not to rely too much on the soft proof – despite my reluctance to waste ink, the best first step is to make an A4 print using the most promising settings, and go from there. (I used to proof much smaller, but things change too much when you reduce a file down to A6; plus now that my system's properly calibrated the

colour correction process isn't nearly so hit-and-miss as it used to be for me.)

As an example of being misled by gamut warnings and soft-proofs into a lot of wasted work, I spent ages trying to pull a bright magenta geranium back into gamut (the super-saturation also appeared to be losing all the veining in the flower). More than half a dozen corrections (and prints) later, I finally tried printing the file uncorrected and found that produced by far the best result!

NB However carefully you calibrate and colour-manage, your prints are never going to match your monitor, and it's a snare and a delusion to try and make them do so. You want to get your image looking as good as possible on screen, and then start the process of making a print – which is a translation from one medium into another – and aim to bring the print alive, *not* to make it match your on-screen original. (Rob Sheppard will set you straight on this!)

Compacts v. SLRs

A year before I got the D200, I bought a Canon Powershot G6. This is a high-quality digital compact, which takes brilliant snapshots and can take good photographs if you stick to low ISOs (not above 200, and preferably 100), and especially if you use raw capture. I took too many JPEGs at ISO 400 in my first year with it – though even these I've managed to print acceptably at A4. Apart from the noise problems inherent in their small sensors (obvious at fast ISOs), the big problem with these rangefinder cameras for me is that if you want to be in control (set the focus point, aperture, etc.), you have to compose on the LCD screen, which means you can't see what you're doing in sunlight

(though attaching a screen hood helps). It's also a challenge to those of us who wear glasses, since you need to be able to focus at 2 inches to see the screen and the next moment at infinity to check your subject. I miss the magic black tunnel you look through on an SLR. They are portable, though!

Getting help when you're stuck

Alas, there are no digital imaging courses for serious photographers in Shropshire, so my first recourse is books (this is a good reason to stick to the most widely used software, since most manuals are completely inadequate and you need a good choice of books instead). The books (among many) I've found most helpful are:

Rob Sheppard/*Landscape and Nature Photography with Photoshop CS2* (2006)

Martin Evening/*Adobe Photoshop for Photographers* (I've got the CS edition, but you'd want the current one instead. He's generous about posting updates on the book's website.)

Martin Evening/*The Adobe Photoshop Lightroom Book* (2007; plus a downloadable pdf update covering the rather considerable changes made to the program shortly after its first release – available from Peachpit if you have the book, or using a code he posted on the Lightroom News website(<http://lightroom-news.com/>)). I actually read the update first, and then decided it was so good I really needed the original book as well, which covers all the areas that hadn't been changed.)

I've also recently discovered video tutorials, which can be extremely helpful. Adobe supplies some with Creative Suite, and I've also looked at many listed by Lightroom News .

Not quite so practically helpful, I've enjoyed many of George Jardine's audio interviews with Lightroom engineers, photographers and printers (see <http://www.mulita.com/blog/>).

I try and stick to manufacturers who offer good technical support – Nikon, Adobe and Epson are all good. I've discovered that user forums are often faster and more helpful than phone support (although I still usually try this first). If you go to the manufacturer's site and then to the support page > user forums, you'll often find the answer to your problem by doing a search there; and if not there'll usually be a prompt response to any query you post. Of course, as with anything on the internet, you have to evaluate the responses you get.

I wish you a lot easier learning curve than mine – and really rewarding results. Good luck!

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