Adobe RGB (1998) vs. ProPhoto RGB

Are you getting maximum quality in your images and prints?

The answer is probably not!

Why? Read on.

This is an extract from an Adobe Technical paper:

At this point, we should put to bed the myth that digital cameras capture sRGB.(see sRGB Vs Adobe sRGB page 4)

The truth is that cameras are not limited to capturing a gamut as small as sRGB.(see page 4)

Very often, cameras sensors capture saturated colours that fall outside the gamut of even Adobe RGB. For some images**, if the goal is to maintain the maximum gamut**, the only colour space that can do so is ProPhoto RGB.

ProPhoto can contain all the colours that a digital camera can capture – even highly saturated colours.

Cameras do not **capture** and printers do not **print** in sRGB colour space. **End of extract.**

**Can you evaluate if ProPhoto is for you?**

**Answer: Yes, by doing a Granges Test** – Firstly you have to do two tests, one in Adobe RGB(1998)

The other in ProPhoto RGB. Because this file is mathematically derived, it contains colours which no display device from which screens to printers can completely display properly, that’s what makes it a powerful evaluation tool.

**How to Create: - Grangers Charts in Adobe Photoshop**.

1. Create a new file, make sure that the background colour is white; 300 ppi in **16 bit RGB** **mode**, size of your choice, i.e. 10 inches by 10 inches or 10 inches by 8 inches.
2. Select the gradient tool, and from the gradient picker chose the gradient called spectrum from the drop down menu. Set the mode to Normal and opacity to 100%.
3. Draw a gradient from left to right, holding down the shift key.
4. Create a new layer, default settings of Normal, 100% Opacity & fill 100%
5. Select the grad tool again, this time choose the Black & White grad, and draw a grad from top to bottom.
6. Finally, double click the layer one thumb nail, Change the Blending mode to “Luminosity”
7. Then Flatten the two layers, save as Granger Chart ProPhoto or Granger Chart Adobe 1998.

Print the two charts on the same paper one in Adobe (1998) one in ProPhoto - Can you see a difference? If you can ProPhoto is for you.

Let us examine some facts.

**ProPhoto RGB colour space**

**PROs**

1. The native colour space of Adobe Camera Raw is ProPhoto RGB, therefore if chose ProPhoto colour space for the output colour space, there is no colour information loss when converting Raw images.
2. In Adobe Lightroom 4 & 5, in the External Editing Preferences, it states that, 16-bit Prophoto is the recommended choice for best preserving colour details from Lightroom.
3. The ProPhoto RGB colour space can hold all the colour information from your camera’s sensor.
4. ProPhoto RGB colour space contains all the colours that your printer can print and more. This means that provided you use ProPhoto RGB colour space, you can print all the colours that your printer is capable of printing.
5. During editing in Photoshop, information is lost. After editing in Photoshop RGB colour space, your final image will contain more colour information than if it were edited in Adobe 1998 colour space.
6. The better inkjet printers and inks are capable of reproducing saturated cyans, magentas and yellows that are outside of the Adobe colour space, making ProPhoto a much better choice.

**CONs**

1. All the colours of ProPhoto colour space cannot be seen on your monitor.
2. ProPhoto RGB colour space **MUST** be used in 16 bit mode. If an image in ProPhoto colour space is reduced to 8 bit a lot of information is thrown away (much more than image was in Adobe 1998 colour space) so banding may occur.
3. Your printer cannot print all the colours of the Adobe ProPhoto RGB colour space**.( But it can print some that cannot be printed using the Adobe 1998 colour space).**
4. If you use ProPhoto RGB colour space and you have a cheap monitor and a good quality printer, the chances are that the printed outlook will not be like the screen output. (You may see a larger range of colours on the print than you can see on your screen).
5. If you do not use a custom profile for your print papers you may not get the best out of using ProPhoto RGB colour space.

**Adobe RGB (1998) colour space.**

**PROs**

1. Adobe RGB 1998 colour space is well proven colour space used by most discerning photographers.
2. Early inkjet printers and the cheaper modern printers only have a few inks i.e. four and Adobe RGB 1998 would let these printers print to their maximum quality which is within the boundaries of Adobe 1998 colour space.
3. If you have a good quality monitor the chances are that if you use Adobe 1998 RGB colour space, you can display all the colours that Adobe (1998) colour space can hold.

**CONs**

1. If you have a good quality printer, the chances are that it can print some colours that the Adobe (1998) colour space cannot hold, so these colours cannot be printed if the image is converted to Adobe (1998) colour space. If you process the RAW file in ProPhoto RGB colour space and import into Photoshop, then convert it to Adobe (1998) colour space, you are disregarding colour information the instant you convert.
2. When a raw file is converted in Adobe Camera Raw, you have the choice of outputting in different colour spaces. If you chose to output in Adobe (1998) colour space, information is discarded and lost, because it is a smaller colour gamut than ProPhoto.

**You now have three options.**

1. Stay with Adobe (1998) colour space – A good general standard but no quality gain.
2. Output images from Adobe Camera Raw into Photoshop using ProPhoto RGB colour space in 16 bit mode for printing. (This method may reduce the editing losses, but it may stop a good quality printer from achieving its full potential.) May not be as using ProPhoto RGB colour space throughout.
3. Change to ProPhoto RGB colour space in 16 bit mode. ( a possible gain in printed output quality **) You have to see a print quality by comparing the two versions of the Grangers Chart to prove this**.

**What in Camera Settings should you use?**

**sRGB or Adobe RGB?**

Adobe RGB and sRGB are two color spaces for use in digital image editing, viewing and printing. While they provide similar color ranges and options, they use slightly different color spectrums and gradients. Adobe RGB uses a larger range of colors, while sRGB has a tighter spectrum, making color transitions smoother. Deciding which mode to use depends on the color contents of the image, necessary compatibility and final display purposes.

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**Use**

Adobe RGB's additional colours primarily highlight rich cyans and greens. This gives the Adobe RGB space a noticeable advantage in images that use these colour ranges extensively, and it makes less difference in images that rely less on these colours. Conversely, if an image uses sweeping, continuous colour transitions, they will appear slightly more uniform in the sRGB colour space, where the gamut does not stretch so far.

**Did you know ProPhoto was implemented by Kodak?**

**I hope you that you may benefit from this information;** on creating this article I have used information from various parties on this subject and would like to give credit to the following.

Adobe.

Luminous Landscape

Canon

Fotospeed

Derek Doar