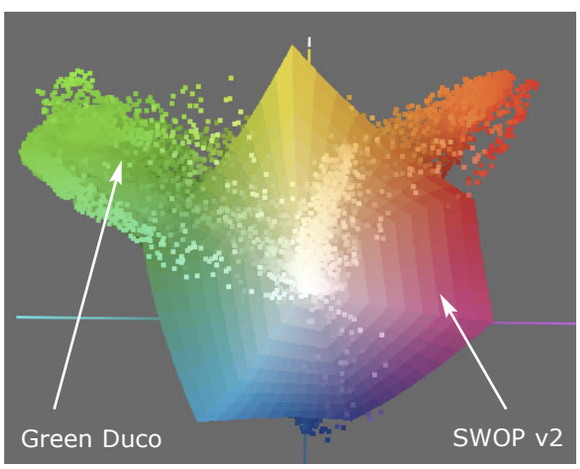
Out of Gamut Colours

Saturated colours such as the green paint of this car can be accurately captured on film or with a DSLR camera. Many of these colours can also be preserved in the Adobe RGB (1998) working colour space. But once printed they becomes dull, flat and lifeless.

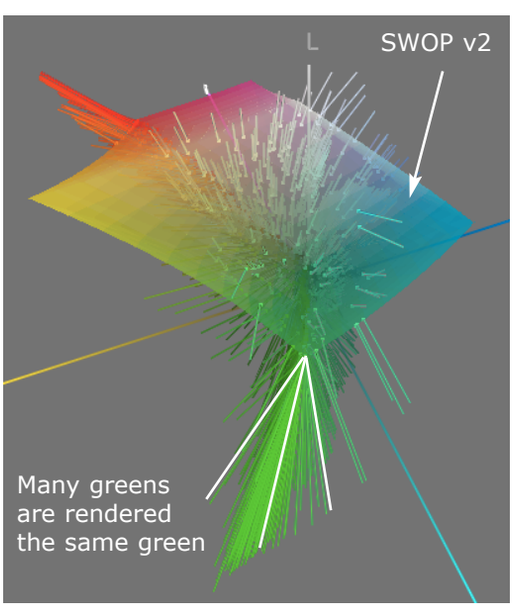
Adobe RGB 1998 (Working Space Profile)

U.S. Web Coated (SWOP) v2 (Press profile)



Many of the colours in this image (35.4% ΔE94>2.0) lie outside of the US Web Coated (SWOP) v2. press profile. This means that they can't be accurately reproduced in this print space. The SWOP profile will render them as the closest but not identical match to the original colours.

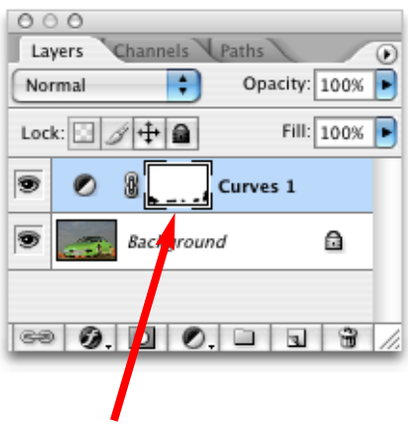
The Colormetric tables in the US Web Coated (SWOP) v2 press profile will compress many of the out-of-gamut colours into a very small range of colours, even rendering different shades as a single colour. For example in the right hand diagram, many of the greens in the car duco are being mapped into the same point (the same colour) in the SWOP v2 colour space. This is why the colours are rendered as a flat, dull, undifferentiated composite green in print.



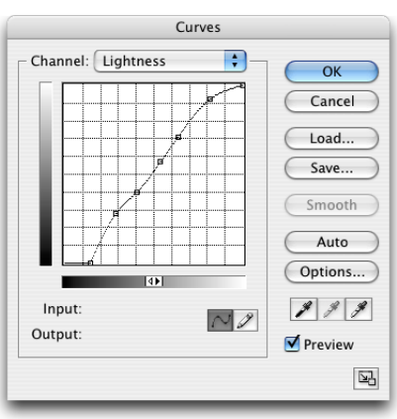
Editing Out of Gamut Colours

Whenever the Perceptual gamut mapping intent in a destination profile fails to adequately separate out-of-gamut colours, then these colours will need to be manually edited into the destination gamut. One approach compresses the colour gamut (range of saturation) to bring the image into gamut and then expands the tonal contrast (range of tones) to compensate for the reduced colourfulness. The Lab format is an ideal working space to gamut compress an image because it separates lightness (tone) from colour.

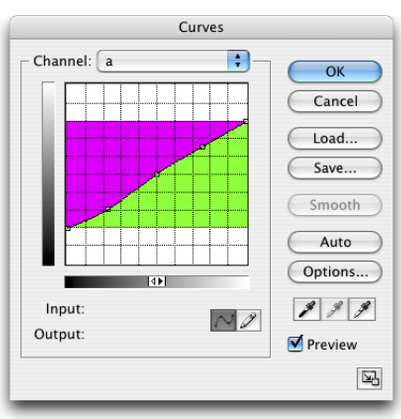
Lab edited image softproofed in U.S. Web Coated (SWOP) v2



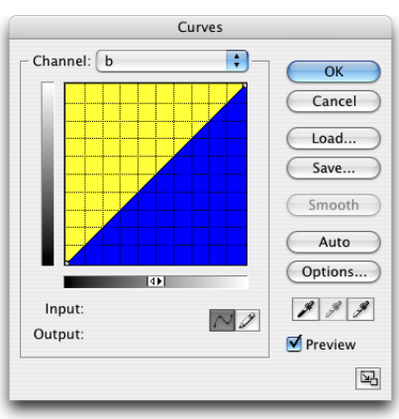
The Layer Mask removes the gamut compress from the orange (magenta-yellow) barriers behind the car



Lightness (Contrast) Curve



a* (Magenta to Green) Curve



b* (Yellow to Blue) Curve

The image is converted into Lab and softproofed through the output profile, in this case U.S. Web Coated (SWOP) v2 which is a standard press profile for high quality magazine reproduction. The out-of-gamut greens are located in the a* channel (green to magenta) and not the b* (blue to yellow) channel. Reducing the gradient of the a* curve therefore reduces the range (gamut) of greens in the image. To compensate for the reduced green 'vibrancy', the gradient of the L* (tone) curve is increased to enhance local separation.