

# There's no such thing as Depth of Field!!!!



Ok so the title of this article is a fairly radical statement – mainly designed to get the reader's attention. I hope to explain, however, that there is one way that it is possible to argue that it is true, and hopefully clear up some of the common misunderstandings that surround this key aspect of photography. The fact is that every lens, no matter how expensive, of any focal length, made by any manufacturer can only focus on a single plane. In simple terms we can define this plane as a flat or level surface or mathematically speaking it can be defined as "A surface containing all the straight lines that connect any two points on it". The key is that it has no depth – in photography terms we focus on a two-dimensional surface and everything else is out of focus!!

So why do we go to all this the trouble of stopping down to maximise depth of field – for that matter what do we mean by "maximising depth of field"? Another question is how do photographers make those fantastic wide angled shots that appear to have complete sharpness from foreground to infinity if it is true that only one plane is actually in focus? Perhaps a slightly less radical title for this article would have been that "Depth of field is an illusion" because this is most certainly true. If we want to define Depth of Field we should state that it represents the parts of our image that are "acceptably sharp". This means that although they are not on the plane that we have focussed on, and are therefore out of focus, they are sharp enough to fool the viewer into thinking that they are sharp. Once the amount that any particular point in our image is out of focus enough, the eye is able to recognise this and this is where we would say "that's not sharp".

What we are actually doing when we stop down to maximise depth of field, therefore, is really to maximise the area that the eye perceives as sharp in the final image. The area of the image we are talking about extends outwards in both directions from the plane we focussed on, and the size or depth of the area expands as we stop our lens down. One thing to remember is that the closer the plane we are focussed on is to the camera, the smaller this depth is for any given aperture. Once we accept that Depth of Field is actually the area of our image that is "acceptably" sharp, another factor comes in to play namely the degree that we enlarge the image in the final print. As discussed we are trying to fool the viewer into thinking that our image is sharp when actually it isn't. This means that the more we enlarge it, the more obvious our deception will become. Another factor we need to think about is the focal length of the lens we are using. Imagine placing your camera on your tripod, then focusing on the same plane with a wide angle and a telephoto lens, and taking two images at exactly the same aperture. If you then enlarged both originals to, say, a 10X8 print, the objects in the wide angle image would be smaller than in the telephoto image. In this case the objects around the plane of focus in the wide angle image would appear to be in better focus. If, however, you enlarged the wide angle image so that specific objects appeared to be of the same size as those in the telephoto image, then the apparent depth of field would be exactly the same in both prints.

So I can here you saying "I don't have to worry about all this stuff 'cause I've got a depth of field scale on my lens that sorts it all out for me". To a certain extent this is true – these scales can be very helpful, but it is a fact that modern zoom lenses tend not to have them. There is, however, a fly in the ointment even if you do have a depth of field scale. The fact is that the camera and it's depth of field scale has no idea how big you intend to enlarge your image when you print it!!! Every lens is different, but in general it is safe to assume that the depth of field scale on a lens for 35mm is only accurate for an enlargement of about 4 times. Consequently if you intend to enlarge your image bigger than 144X96mm you will need to stop down further than your scale suggests.

One final consideration we need to make is a fairly objective one. It refers more to the practical, rather than theoretical use of depth of field. When we are photographing something as large as a landscape, where do we chose as our plane of sharp focus? Many of you who have been on Charlie's trips will be well aware of the concept of hyperfocal distance. I don't want to explain it all here, as it is worth an article in itself. Suffice to say that it is possible to work out the optimum point to focus the camera such that the sharpness of any two points at different distances from the camera is maximised. There is an objective argument, however, that says that objects, (for example) silhouetted against the horizon need to appear sharper than those close to the camera in order to maintain the illusion of overall sharpness. You will need to experiment and make your own decisions, but I would suggest that in certain circumstances you should bias your plane of sharp focus away from the camera in order to ensure that the illusion is maintained. The fact remains that as with main areas of photography, our decisions regarding the plane of sharp focus and the amount of depth of field we can attain end up being a compromise. The key is that you are able to make those decisions from an informed basis rather than relying on luck, your camera/lens manufacturer or even an "illusion".

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