

DIGITAL PHOTOGRAPHY

Kelvin Aitken's unique and comprehensive how-to guide

WORK OUT YOUR WORK FLOW

No matter what your end goal may be with the photographs you take on each dive, no matter how they will be used and no matter how experienced you may be, having an efficient work flow will save you hours of effort and keep you sane.

By work flow, I mean the process by which you take your photographs, transfer to your computer, select individual images, optimise them for a particular purpose and save them for later use. Drop the ball at any of these stages and you will be tearing your hair out in frustration. Let's look at a basic work flow to keep life simple and stress free.



A card reader usually has slots for various sized cards. They are light weight, compact and cheap. While a camera to computer connection cable is smaller and lighter, you are often stuck with having to use the camera's software to transfer images.

The starting point is, of course, at the camera. I can only assume that you have your act together there. A freshly charged battery for each dive (for both camera and external flash/strobe if you have one), a newly formatted empty card and a well maintained housing. It always pays to take a shot or two just before you don your dive

gear to check that your camera has the lens cap off, the main power switch is turned on, your auto focus is working, you have a formatted card inserted and that the external flash/strobe connection is functional.

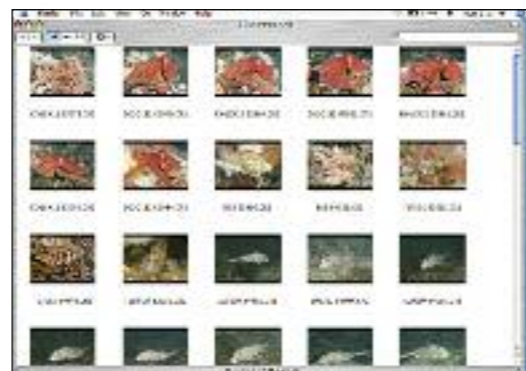
Even if you checked back at the dock, gremlins live on boats. Vibration during your trip to the dive site can do all sorts of nasty things, mostly with electrical connections and meshing between controls and gears. Gears can slip on lens barrels, the locking screw that holds the camera in the housing may loosen allowing the camera to twist inside the housing by a touch, putting controls out of whack. Hot shoe connections can move just 1mm to break the flash connection or you may have had a brain freeze in the car park and left your lens cap on or forgotten to put in a battery. I hate boats. Nasty things happen on boats. They are an unnatural contraption designed to keep boat owners poor and stressed. They move all the time and are always built for small people. I have the head lumps to prove that. So take a moment before your dive to clear your mind and calmly check that all is working as it should. Don't be rushed or pressured by others. Then go enjoy your dive.

After all the screaming and yelling is over, the dive gear is washed and stowed and you can sit down in peace with your compact flash cards (one per dive, right?) you can begin to have fun with your images. First step is the physical transfer of all files from the cards to your computer hard drive. You can do this by either transferring via a cable (or wireless transfer if your camera has that function) from your camera or, as I prefer, a card reader.

There is no particular benefit of one method over another, you just need to get the files safely transferred. Camera cable transfers usually require that you use the camera software supplied on disc when you purchased your camera. I find this method annoying and unnecessarily complicated. With a card reader I can plug in the card and, voila, it appears on my desktop where I can copy either the entire folder or individual files. But, as I said, just use whatever method makes you happy and gets the job done. Do not format the cards yet.

The next step is to select the images you wish to work on. If you fluff up and accidentally delete files or your computer 'does a Chernobyl' and melts down your hard drive, you still have your original files on the compact cards.

How you view and select images will depend on your software. You can use the most basic of viewers, an open finder window set to view the files as thumbnails. It's a little slow at times when viewing Raw files and some older computer systems may not be able to show a thumbnail from a Raw image, but generally it does work. I



A quick and dirty way to quickly look at your images without using ponderous software applications. Modern computers will usually be able to show thumbnails (just make sure your finder window is set to view files as thumbnails, not as a list) for most image formats, even non image files such as a Raw camera file, which is a bunch of data and not yet a true image until it is converted. You can use this simple viewer to delete black exposures (where you flash did not go off) and pick out one or two files for immediate use. A true Raw file viewer and converter, such as Bridge or Lightroom, has more control and editing options.

prefer to use a program intended for image viewing and organisation such as the camera software or an image editing program, such as Bridge, supplied with Adobe Photoshop. There are so many programs available that we will just deal with the principles here.

To keep things tidy, you need to be able to mark, flag or otherwise select images for use. You may have shot, say, 100 images on a dive, but only want, at this stage, to use 2 or 3, or maybe 10. So your software should be able to flag those images you want to use and then give you the option to view only those flagged images, or copy them to a new folder. If you are just using your finder window, create a new folder giving it a distinctive name. Then copy the images you want to that new folder. Don't just move them, copy them. That way you still have your full collection of images intact. If you start moving individual images around you end up with your days effort scattered all over the place. That may suit your needs now, but I suggest that for future use, keeping the entire collection of images from a day or dive in one folder will keep you sane.

Taking a step back to the pre dive preparation of your equipment, I strongly suggest that you make sure that your camera keeps the Raw file that is created at the moment of exposure, even if you only ever use jpeg copies. If your camera allows you to save the Raw file, then by all means do it. The only disadvantage of keeping the Raw file is that it takes up a little more room on your compact disc or computer hard drive. Back in 1990, that was an issue. Today, you can buy compact cards big enough to allow you to shoot all day, or external drives of 2 or more terabytes for what some people spend on cigarettes for the week. So save the Raw file. It costs nothing, takes no extra effort and will pay you back in spades now and further down the track.

Once you have selected an image you want to use, open it in your editing software. If you are using the Raw file, make basic adjustments to get the image looking close to how you want it to be. That means tweaking the exposure slider and the colour sliders. Some people get all fussy at this stage, trying to get the image to look perfect. But conversion or viewing programs are only designed to make basic adjustments. Doing final tweaks is what your editing program is for. If your conversion program (possibly the software packaged with your camera) is your only software option, then by all means fiddle away. But for normal editing purposes, just get the image looking close to how you want it to be. If you are using a jpeg file, just open it with your editing software.

Every image will have a unique need as far as exposure, contrast and colour adjustments are concerned. If you have a number of images, such as a close up of a shell, that are essentially the same colour and exposure, you can do a batch convert of your Raw files. But each individual image will still benefit from minor tweaks. First step is to get your Levels right. This is where you move the darkest and lightest pixels to their appropriate position on the luminance scale. In Photoshop, that is done manually by opening the Levels dialogue box (Image>Adjustments>Levels) and moving the shadow and highlight sliders across to meet the point where the darkest and lightest pixels are found. Depending on your image and exposure, this can have either a minor or a dramatic effect on your image.



A typical Raw converter window in an older version of Photoshop. You can set the colour space, bit depth, image size and dpi for the converted image (A) which will apply to all images opened by the converter. Colour can be tweaked using the sliders (B) or the eye dropper tool (shown as selected in the top left tool bar) to make a mid grey tone (I used it on the grey spot on the chimaera's face to get a pleasing colour balance). I usually leave the other sliders (C) on Auto, leaving saturation and contrast adjustments to my photo editing software, but usually manually tweak the Exposure to get the histogram (D) looking right with no clipping. You can adjust for colour aberrations, sharpening or specific tonal adjustments using the other tabs (E) though I usually only use the Curves on occasion to make sure my highlights have some density if needed, and leave the rest for Photoshop.

You can select an automatic control to do this for you by clicking on the Options button in the Levels dialogue box or the same button while using the Curves dialogue box. (This is the method I prefer as after making an auto levels adjustment I can then go on and make colour and exposure adjustments as well.) You have three auto options to choose from and a Snap Neutral Tones option for each of those. Try each combo. Usually the Enhance Monochromatic Contrast works best for most underwater images, the Enhance Per Channel Contrast works for some images and the Find Dark & Light Colors is a waste of time. But fiddle and find what works for your particular image.

The Gamma or middle slider can be left alone, but by all means play with it to adjust exposure as that may suit your image. Personally, I use the Auto levels then use Curves to finish colour and exposure adjustments. It is neither right or wrong, just one way to deal with multiple adjustments. You can use multiple dialogue boxes to adjust levels, colour and exposure, or use just one to do all. Work out what suits you.

Once your image looks right, save it as a Tiff file. If you are using a Jpeg file made by your camera, re-saving as a Jpeg will re-

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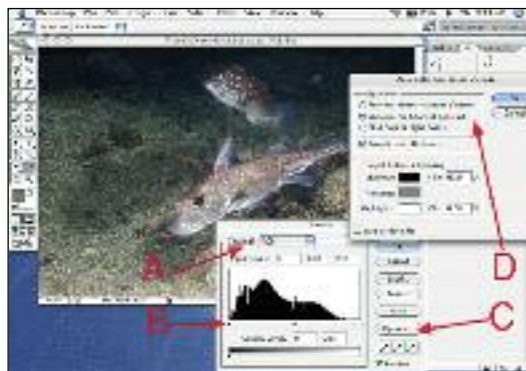


new marine dive adventure to be experienced or invented, he's always the first to put up his hand. He's also dived the southeastern Australian continental shelf and photographed shark species nobody knew would be found out there. Kelvin is a BBC Wildlife Photographer of the

Year marine category winner and his unique work is on www.marinethemes.com

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You can tweak the shadow, mid tone or highlights for either the entire image or, by using the drop down menu (A), one or more of the colour channels. The sliders (B) can be moved to the darkest and lightest points to adjust levels and overall contrast. Or you can use the Options button (C) to give you three Auto settings (D) plus a Snap Neutral Midtones option. Fiddle around and see what works for your unique image. I usually chose whatever places the colour balance in about the right spot, then make any further adjustments if necessary using the Colour Balance or Curves dialogue boxes. Just make sure that you don't clip any information off by having the Shadows and Highlights clip boxes set to zero.

image? Print it? Send it by email? Put it on a web page? Use it as a desktop image? Or maybe a combination of all of the above. If you are sending it out to be printed, check with the printer what dpi (dots per inch or pixels per inch) to use. It varies with the printer. I have used a number of dpi settings from 300 down to 150 dpi depending on the printing device. For display prints, one lab I use requires 250 dpi, another wants 200 dpi. So check their web site or make a call.

I use two slightly different methods to resize files. Let's say I want to make a print to fit on an 11x14 inch piece of paper (photographic paper is usually made in imperial sizes, even if it is described in the metric equivalent). Open the Image Size dialogue box (Image> Image Size). Make sure the Constrain Proportions and the Resample Image boxes are checked. First, put in your dpi in the Resolution box. Then put in your document size. In my case, I would put in 14 inches in the width box and the software automatically works out the Height. This usually gives me a little bit of paper that will need to be trimmed off. If you turn off the Constrain Proportions check box you can stipulate both width and height, but the software will then stretch either Height or Width to fit the final size, which will distort your image.

To make the size exactly what you want without distorting it, use the Crop tool. Select the Crop tool then in the Options bar at the

compress your file causing more loss of information. Create another folder and use the 'Save As...' option to save yet another copy. Now you have your original still on your compact flash card, a copy of all images shot in your download folder, a copy in your folder of selected images (if you copied them at the initial selection stage) and now a copy of the adjusted image. Now, what are you going to do with your

top put in the width and height followed by 'in' to indicate inches then put in the dpi. Now, starting at one corner, say, the top left, drag the crop tool to select the area of your image that will be within the 11x14 proportion. You will end up cropping something but you will have an exact size to fit your paper at the right dpi without distortion.

If you want to send a pic via email or to fit on a web page, the magic number is 72 dpi. Instead of inches or cm you will be working in pixels. In the bad old days, computer monitors were 640x420 pixels. This can still be found in monitor display settings. For modern use, this is still a great place to start for a web page image or as an email attachment. There is nothing more annoying than opening an email with an image so big you have to scroll around to view it. Keep your friends by making your emails easy to view. Send yourself some test emails with image attachments. You may decide that something smaller, say 500 pixels on the longest side, is more along the lines of what you want.

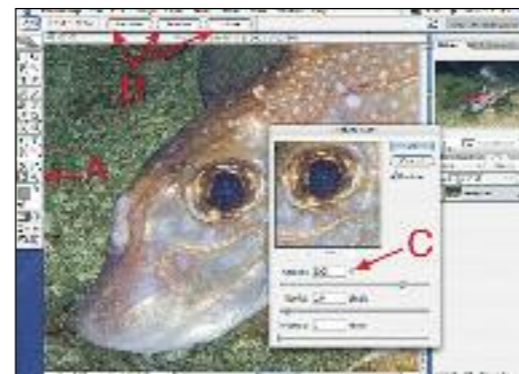
If you know the exact size in pixels that you want for a web page, make it so at 72 dpi. Otherwise, stick to 500-700 pixels on the longest side and use your page layout software to reduce to fit your layout. Some web sites will automatically downsize files when you upload them, so a 600 pixel (give or take) image is a good place to start.

When you have your file the right size, now is the time to sharpen. All digital files will benefit from some sharpening. Some print labs will do this automatically at the printing stage. For web or email use, enlarge the image to 100% then apply sharpening. Don't over do it. For small email and web files, start with 50-100% in the Unsharp Mask dialogue box with the Radius set to 1 and the Threshold to 0. Images for print will do better

with 100-200%. the bigger the file, usually the more sharpening is needed. There is no perfect setting. It will vary greatly with



To get an exact proportion, select the crop tool (A) and drag it on the image to select an area. You can move the selected crop area using the arrow keys on your keyboard. You set the size of your crop in the options bar (B) and can have the cropped area shown as a dotted line with a darkened outer area. If you don't want to crop off any of your image and don't need the height or width to be exact to fit the paper, just use the Image>Image Size dialogue box.



Sharpening will not save a badly focused or motion blurred image. But it will make a good photo better as all digital files have at least one channel (usually the blue channel) a bit soft and fuzzy. There are multiple ways to sharpen an image including converting your file to the LAB colour space or just selecting one colour channel from the Window>Channels tab. But usually, Unsharp Mask does the trick just nicely. Select the Hand or Zoom tool (A) and then select one of the zoom buttons (B). We need the Actual Pixels to go to 100%. Or you can just double click the Zoom tool. Go to Filter>Sharpen>Unsharp Mask and in the dialogue box move the slider or set the % box to what suits your image. Set the Radius to 1.0 and the Threshold to 0 as a starting point. It will take a bit of practice to get the right amount as some printers add sharpening during the printing process. If your image is going to a publisher, do not sharpen. Let the printer operator do that to suit their unique set-up.

will need to now convert the file to 8 bit in order to save as a jpeg. For web use or email etc, you can use fairly high compression, such as level 2-5, and you can also turn off the Embed Color Profile option as web browsers and email messages have no colour management. This will save you a small amount of file size. For print, use minimum compression, level 12, as delivery will probably be on a thumb drive or DVD discs so there is no need to worry about file size, or save as an 8 bit tiff file. Don't apply any tiff compression as that may cause problems at the printing lab.

While on the subject of saving, Photoshop, and other software varieties, give you multiple formats in which to save your file. To cut to the chase, you only need to think of using 3 formats: tiff, psd and jpeg. Whenever you save a file after converting from the Raw file, always save as a tiff file. You can compress them if you wish using Zip for 16 bit images, or LZW for 8 bit images but you will save time later when opening if you just save them uncompressed.

your lens quality and ability to hold your camera still. Having said that, sharpening is to overcome the inherent 'fuzziness' of digital files, not your lousy focus, dirt cheap lens and camera shake. It may help, but will not cure a badly shot image.

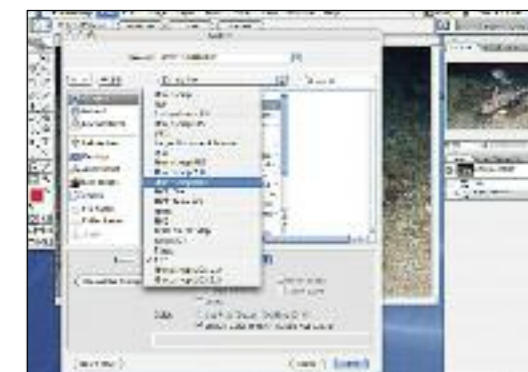
Save your finished images to a new folder. At this stage, saving as a Jpeg file is fine. If you started with a Raw file, you should be working in 16 bit up to this stage so you

PSD files are the Photoshop format. I use this when saving a file with layers. I could save as a Tiff with layers but down the track I can quickly see which file has layers by looking at the .psd extension. If your software is not Photoshop, just save as tiff with layers intact and maybe add the word 'layers' to the file name.

Photoshop has something like 20 different save formats. Most are for graphics images such as text and solid colour shapes so you can ignore them. i.e. Gif files are for web use and are best suited for solid colours, not photos. There is also a Photoshop Raw format. This is intended for very large files, multiple gigabytes. I cannot stress this enough: you cannot 'make' a Raw camera file. You cannot have your camera save all images as jpeg files then later miraculously save them as Raw camera files or 16 bit tiff files. When you bake a cake, if you forget to put in the sugar, flour and baking powder, you cannot just inject them into a baked cake later and expect it to be a real cake. When your camera saves your images as jpegs, in the process it dumps enormous amounts of information, all with the intention of saving disc space. Your cake will be much smaller, but at what cost?

ALWAYS have your camera save the Raw file, even if at this stage you don't use it. It's only disc space, and not much at that. A 10 megapixel camera makes a Raw file around 10mb in size. That's nothing when you look at the benefits of having all the information from your camera chip.

As a final step to your work flow, record your day's shooting in a database. Include meaningful information such as date and dive location and subject matter. We have covered databases before, just make sure you use yours. It will save you major headaches down the track.



There are a myriad of saving formats. Just stick to tiff, photoshop and Jpeg. For photos, the others are less suited. The Photoshop Raw format, shown as highlighted in the drop down menu, will not turn your jpeg into a raw file. You cannot cheat the laws of physics. The only way to get a Raw file is by setting your camera to save it at the time of exposure.

LINKS>

http://www.damiensymonds.com.au/tut_usm.html
<http://www.luminous-landscape.com/tutorials/understanding-series/understanding-usm.shtml>
<http://www.cambridgeincolour.com/tutorials/levels.htm>
<http://www.photoshopeducation.blogspot.com/2009/09/cropping-canvas-image-size.html>
http://www.sharpened.net/helpcenter/answers/canvas_size_vs_image_size
<http://www.photoshopenessentials.com/photo-editing/crop-images/>