Basic Image Processing: Mark 2 – Glenn Pure

In the April 2015 newsletter, I described some basic and simple processing steps to prepare images for uploading to the Birdlife Photography website (BLP). It was designed to help newer, less experienced members and based on my own learning experience as a newcomer to BLP. I've since made further discoveries and refinements that don't significantly complicate the process or take much time but do markedly improve the results. Hence, a 'Mark 2' of the April article is warranted. Like the April article, it assumes that you are starting with a RAW file for processing.

First some comments on why we should concern ourselves with this subject. Images straight from the camera that have had minimal processing (perhaps just exposure adjustment) will usually have problems. These can include missing detail in highlights and shadows, noise and lack of sharpness (the latter being an inherent problem resulting from compromises in camera design). Some relatively simple and quick steps can fix these problems and markedly improve image quality. Secondly, improving the standard of images posted to BLP will be a key task to support the efforts by the committee to make BLP the premier destination for images of Australian birds. It's obvious we can all help with that by maximising the quality of what we post.

Processing involves fixing exposure problems, correcting white balance, effective sharpening, controlling noise and cropping. From time to time, an image may present other challenges, or aesthetic considerations may call for different treatment, but the basic workflow in this article will apply to most images. In any event, having control of the basics presented here is, in my experience, essential first.

By and large, these processes can be implemented in all common software packages, notably Photoshop (or Photoshop Elements), Lightroom and GIMP (freeware). For Canon users, there is an additional piece of software shipped with their DSLRs – Digital Photo Professional (DPP). It can do a few unique and remarkable things and is easy to use. I've covered how to use features available in the latest version (version 4). Canon made some major changes to the software when it released version 4 and I'd recommend upgrading to it – it's free after all. Nikon supplies a RAW converter called Nikon Capture NX-D but it is basic and not comparable with DPP.

I personally use DPP for initial processing and Photoshop Elements (PSE) for subsequent steps. In part that was an accident of circumstance as I already had a version of PSE (version 9) but it would not open the RAW files from my Canon 700D so I do initial processing and conversion in DPP.

This article does not cover touching up parts of images with cloning tools and similar. It also does not cover image composition.

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An image before (left) and after (right) basic processing was applied. This image had a number of problems: the background was noisy, the bird's head was too dark and missing detail, and the image appeared soft even though the bird seemed to be in focus. [Note: you may need to zoom this document to see the difference clearly.]

Overall Strategy and Order of Processing

The first priority should be to preserve as much information from the image by working on the RAW file or, failing that, a 16 bit TIFF version of it. Only the final steps should involve manipulation of the JPG version. The reason is that as soon as the image is converted to a JPG, which only holds 8 bits of information for each colour channel (red, green and blue), much of the capacity to fix over-exposed or under-exposed parts of the image and correct colour imbalances is lost. Also, every time a JPG file is re-saved, it degrades further because the JPG file format loses some information on each save due to the compression algorithm used.

The order in which some processing steps are undertaken is important. Exposure and lighting adjustments should be made early in the process as these steps depend most on the greater luminance information in the RAW file. Noise reduction and an initial round of sharpening should also be performed while the image is still in RAW format. The very last things that should be done are scaling to a suitable size for posting to BLP, a final round of sharpening and JPG conversion. Cropping can be done at any point. My preference is to do it at the start of the process.

Photoshop, PSE, Lightroom and DPP (Canon users only) can all handle a wide range of RAW file manipulations. GIMP can only process TIFF or JPG files but standalone freeware RAW converters are available to prepare and convert RAW images. However, *be aware that not all RAW converters are equal; some do a much better job than others*.

Step 1: White Balance and Exposure Adjustment

White balance should be set to reflect the original lighting conditions of the subject (full sun, in shadow, cloudy, flash, etc.) so that the most accurate colour rendition is obtained. In most cases you won't need to do much more than that. There may be some exceptions, for example images taken around sunrise or sunset. The white balance adjustment in such cases will depend on the result you want to achieve. Do you want the bird to look like it was taken in the yellow light of the setting sun, for example? If so, start with a 'daylight' white balance setting and fine tune using the colour temperature slider to achieve the result you are after.

Exposure adjustment is slightly more complicated. In addition to setting the brightness for the aesthetic effect you are looking for, you should ensure highlights aren't blown out and lacking detail or that the shadows and dark areas aren't too 'inky' and missing detail. Obviously, that's more important for the main subject in the image and less important for backgrounds. Sliders are available for lightening shadows and darkening highlights in Lightroom, Photoshop/PSE and Canon DPP.
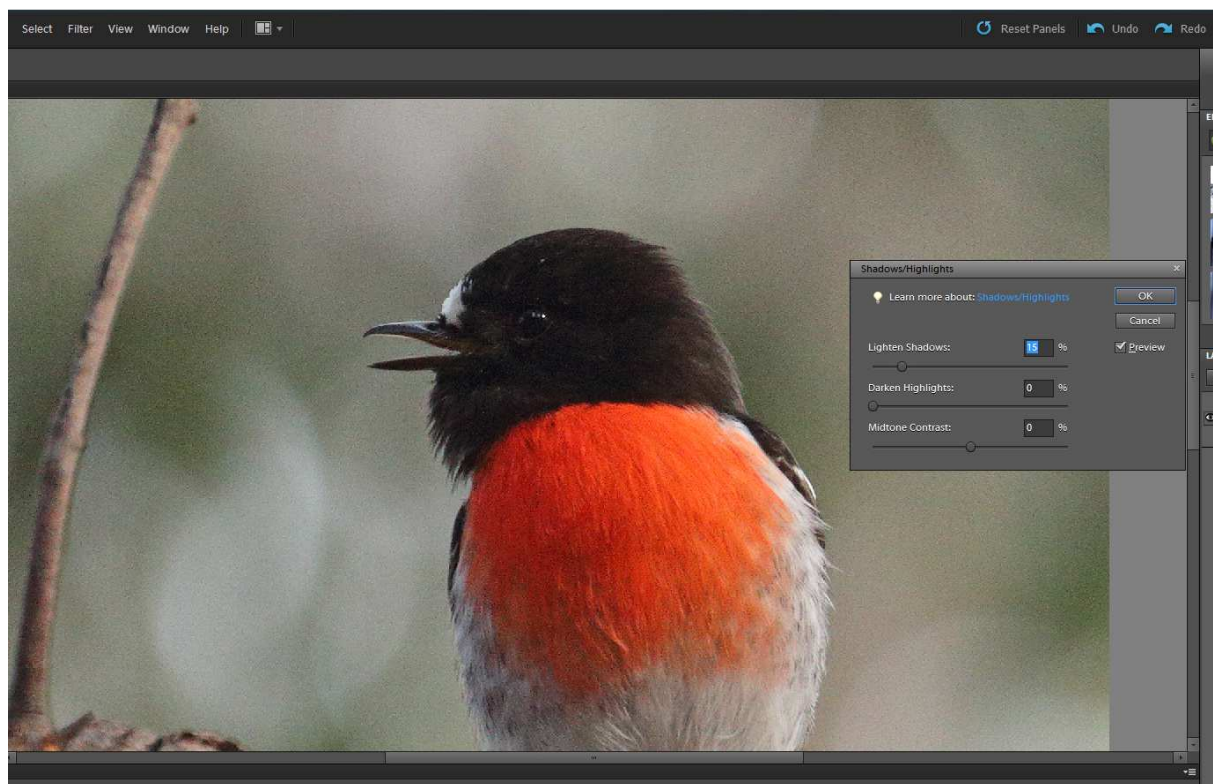
The Shadows/Highlights lighting adjustment in Photoshop Elements (Version 9).

Finally, be aware that *the room lighting where you are using your computer may influence the results*. Bright room lighting (lots of sunshine entering a window, for example) will make images appear darker on your screen and vice versa. Similarly, the colour temperature of the room lighting can subtly affect the appearance. Aim for some consistency between editing sessions. A happy medium is a good goal – don't have your room lighting too bright or dark. To obtain consistent colour control, have your screen in a place where you can see sizeable patches of white wall or similar in your peripheral vision as your brain is very good

at compensating for the effect of colour casts caused by different lighting types. Ideally your monitor should be calibrated but that is too in-depth for this article.

Step 2: Initial Sharpening

This is best done before initial noise reduction as sharpening does affect the noise level. The main message here is to be fairly conservative. The aim is to bring out enough detail to enable the final round of sharpening (later) to be effective. Don't aim for a final sharpness result at this point. Some experimentation will help to get the right mix between initial and final sharpening.

Depending on what software you are using, you may have a choice of either adjusting 'Sharpness' or applying the unsharp mask. I've recently switched to adjusting sharpness as it introduces fewer artefacts into the final image while still effectively sharpening.

For those using Canon DSLRs, I'd strongly recommend the Canon DPP software. It has the unique capability of improving image sharpness by removing blur introduced by the lens and sensor. The software uses proprietary lens and camera data from Canon. To use this feature, data for your lenses needs to be downloaded. Luckily that is an easy process.

BLP member Ian Wilson tells me that Canon DPP software is the preferred RAW image processing software used by many top bird photographers around the world. The best bit is that it's free and fairly easy to use! Some older cameras are not supported by DPP4 and for these you should download version 3 from the Canon website. To download the latest version of DPP4, find your camera model on the website. At the bottom of the page for your camera, there will be a 'Support' tab under which you can select 'Drivers and Downloads'. The latest version at the time of writing was 4.3.31.

Step 3: Main Subject Noise Reduction

The initial round of noise reduction is applied to the whole image and will consequently affect noise in both the subject and background. When making adjustments, your attention should be on noise levels in the main subject. The second round of noise reduction later will deal with background noise. Colour, or chrominance noise as it is sometimes called, can be effectively reduced with little loss of detail but be careful of artefacts if it's turned up too much. Care is needed with 'Luminance' noise reduction as stronger application here does seriously impact detail and sharpness.

Step 4: Background Noise Reduction

The next step is to deal with noise in the background. Noise is generally much more visible in smooth areas of tone, such as out-of-focus backgrounds. Fortunately, detail usually doesn't need to be preserved in those areas so more severe noise reduction can be applied. I never used to bother with this step but now do it routinely because I'm reliably advised that it's considered bad practice not to control noise.

The first step is to select the appropriate part of the image using suitable selection. This is the step I've found takes the most time. You may also need to treat the bird's perch as part of the main subject if this is in sharp focus as it will look odd later if that part of the image loses detail when noise reduction is applied. If you are using Photoshop or PSE, save your selection; and it's also a good idea to save your image at this point too, in case you need to re-process the image. Any saved selection will be included in the file you save.
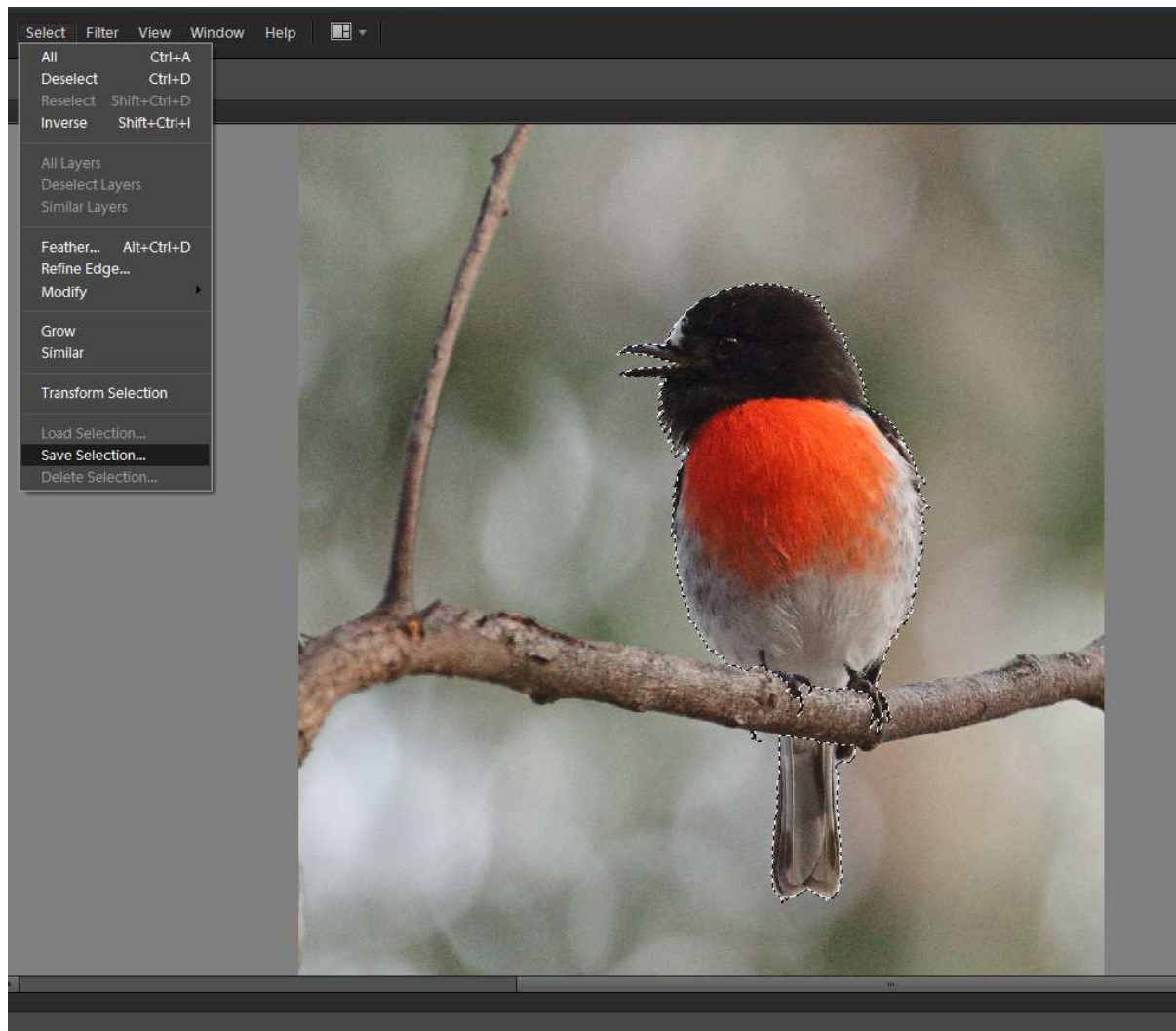
The 'Save Selection' menu item in Photoshop Elements, showing the bird only selected.

Next, invert the selection, and then select a suitable noise reduction filter. There are several noise reduction tools in PSE/Photoshop. Because the selection you made was inverted, noise reduction will only affect the background.
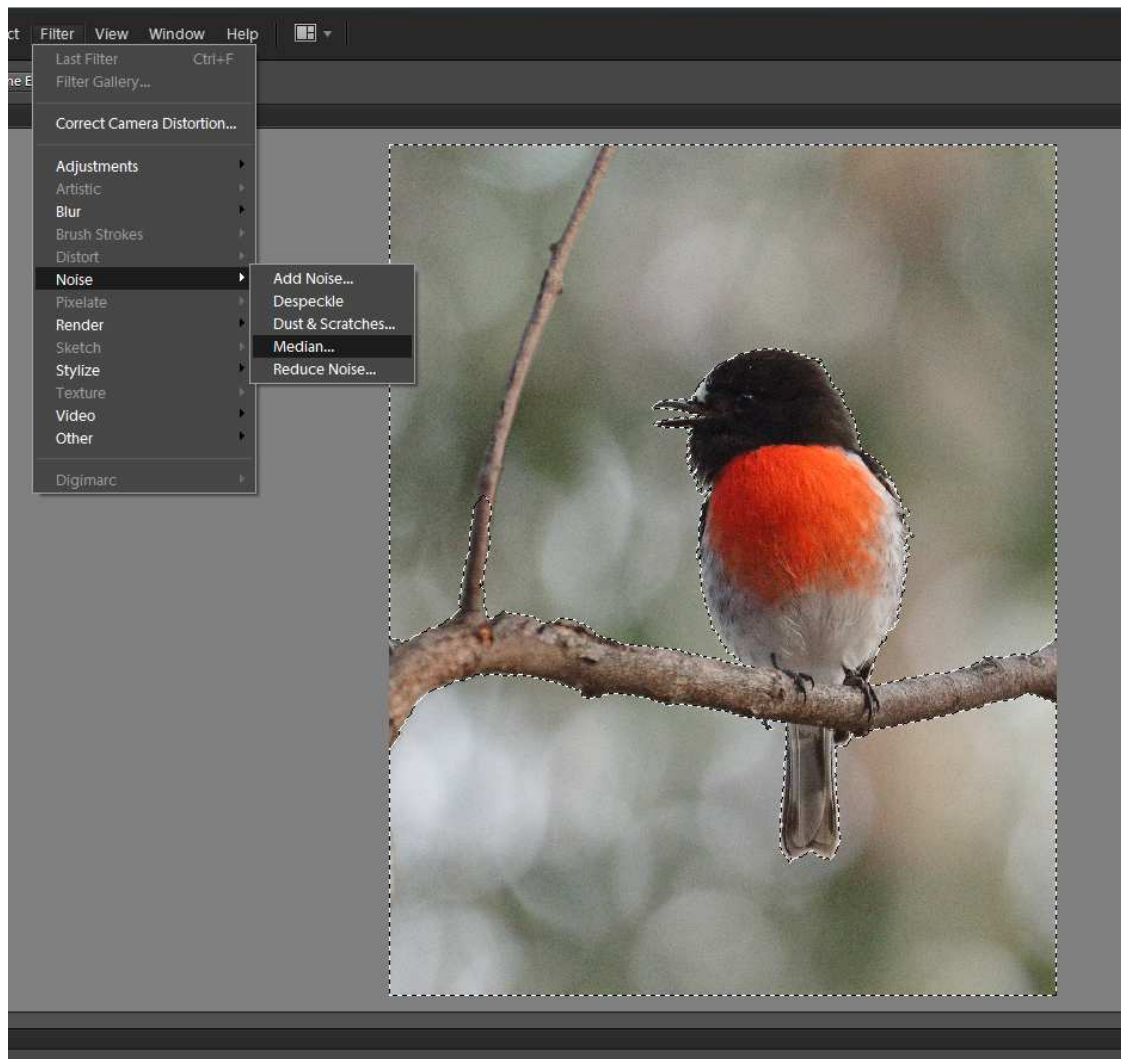
The noise reduction menu item in Photoshop Elements. Note that the selection in the image has been inverted, and is now the background only; the bird and most of its perch are not selected.

The process is a little different in Lightroom. Select the background only with the Adjustment Brush. There is only one slider for noise reduction that will work with Adjustment Brush selections.

Final Steps: Scaling, Final Sharpening and JPG Conversion

If you haven't cropped yet, it's a good idea to do this before scaling. When scaling, remember the current maximum size for images posted to BLP is 1400 x 1050 pixels (w x h).

Final sharpening is the last step if you are using PSE/Photoshop. This will be selectively applied to the main subject only. Sharpening the background is pointless and will only add noise. You will use the main subject selection that was saved a little earlier. Loading this selection will mean that sharpening will only apply to that area of the image. I have been using the Sharpness function rather than Unsharp Mask, as explained earlier. Sharpen just enough to bring out the detail. Over-doing it will make the image look unnatural.
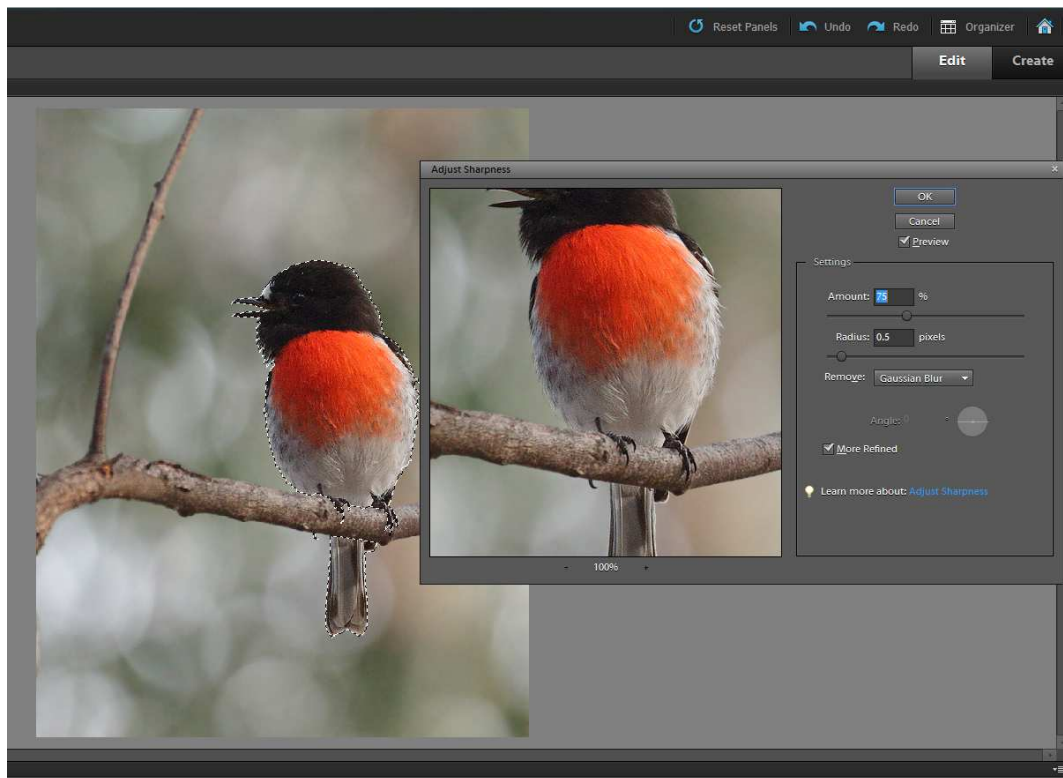
The 'Adjust Sharpness' dialog box in Photoshop Elements.

Once done, the image is saved as a JPG file of suitable size for uploading. The maximum size allowed on the BLP website is 1024 kilobytes. It's sometimes necessary to reduce the JPG quality setting to get the file below the maximum size. You're now done and ready to upload.

Again, the workflow in Lightroom is a little different. Use 'File: Export' and select JPG as the file type. Sizing and final sharpening options can also be set as part of the save process although selective sharpening of the main subject isn't possible at this point because of the way Lightroom is designed.

Cropping

As mentioned, cropping can be done at any point. My preference is to do it at the start of the process. This can be achieved in Photoshop and PSE by making a rectangular selection of the portion of the image you wish to keep and selecting 'Crop' from the appropriate menu item. There are crop tools in Lightroom and Canon DPP that are simple to use.

More information and acknowledgements

If you want more information, further coverage of many of the subjects here can be found in Ian Wilson's 2 part article 'Seven Deadly Sins' that appeared in the June and August 2015 newsletters.

I'm very grateful to BLP member Ian Wilson for sharing his experience in processing images and providing comments on the draft article; however, all views expressed in this article are my own.