PHOTOSHOP I FOR PHOTOGRAPHERS

Covers Photoshop CS4 to CC2015.1
by Robert Berdan ©
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Contents

Introduction and objectives

Digital photography has exploded in the past two decades as consumers and professional photographers embrace digital photography.Digital technology is capable of achieving results superior to images produced on small and even medium format film. These notes cover several versions of Photoshop – from CS4 to CC2015.1. Some steps may be a little different in different versions of Photoshop and some features have disappeared (e.g. Extract filter replaced was replaced with the Quick Selection tool in CS6) and new features have been added. If a tutorial only works in a more recent version of Photoshop I will indicate this at the beginning of the tutorial.

Advantages of digital cameras include:

1) No cost to shoot as many pictures as you like.
2) Immediate preview of the image taken on the camera LCD monitor.
3) Wider dynamic range resulting in better shadow detail and overall tonal range.
4) Lower noise and grain at high ISO speeds and ability to shoot at any ISO speed anytime.
5) Camera can be st to automatically change setting as it get darker or lighter.
6) Ability to shoot thousands of images on a memory card - no 36-frame limit as with film.
7) Ability to correct white balance and exposure after taking your picture using software.
8) Ability to sell and distribute your images worldwide using the Internet.
9) Digital files have greater stability then film and are insensitive to airport X-rays.
10) Ability to shoot colour, black and white, sepia, even infrared with some digital cameras.
11) Ability to combining several photos with different exposure into one (HDR imaging)
12) Ability to capture pro-quality high definition (HD) video in a small light weight package

Disadvantages of shooting digital include:

1) Larger number of camera features to learn about resulting in greater complexity.
2) Camera manuals can exceed hundreds of pages.
3) Digital cameras depreciate quickly as newer models appear.
4) Digital cameras require power to shoot.
5) Digital Images often require tweaking in an image editing program to look their best.
6) The newest cameras require Photoshop's latest Adobe Camera RAW to be opened

Although digital cameras tend to be more complex than their film counterparts, the ability to view an image immediately after shooting and the low cost of digital images means photographers can learn and improve faster than ever before. I believe photographers determined to stay with film do so either because they don't wish to spend the money to upgrade, don't use or want to use a computer and\or do not fully realize the benefits of digital photography. I have used film for over 30 years and there is no doubt that today digital technology is superior to film in most circumstances. Long exposure photography at night may be easier with film or shooting where it's not possible to recharge the camera batteries – though there are solar rechargers available.

What is the best file format to shoot images with on your Camera?

When starting out most new photographers shoot JPG files (JPEG Joint Photographic Experts Group) as they don't require special software to view them and they are smaller in size than RAW files. JPG images can also be processed in an image editing program, but don't offer as much editing flexibility or quality compared to RAW files.. If you are a new shooter you can set your camera to shoot both RAW and JPG files, it takes up more space, but you will have more options in the future for processing important images. I shoot in RAW mode 99% the one advantage of shooting JPG files is that if you shoot JPGs your camera can sometimes shoot at slightly higher frame rates.

In this workshop you will learn how to calibrate your monitor, set up Adobe Photoshop so it uses colour profiles to achieve consistent results, and you will learn the steps (workflow) required to colour correct images and make them look their best. In addition you will learn how to convert your colour images to black and white, sepia, make a black and white image leaving behind some colour, extract an image, blend images into a panorama, and fix a variety of defects such as red eye, dust spots, crooked horizons and more. In short, you will be introduced to the power of Adobe Photoshop and what it can do to make your images better and have some fun doing it. Mastering Photoshop, is a bit like learning to play a musical instrument will take years to master, but these tutorials will get you up to speed quickly – and if you take my workshop this can be done in one or two days.

Components of a Digital Darkroom

1) A computer (PC or Mac), LCD monitor, color printer, scanner, and a digital camera.
2) Image editing software e.g. Photoshop, Elements, GIMP, Picasa etc.
3) Electricity .
4) Internet access for tutorials, downloading software, and to share your images.

Computer minimum requirements to run Photoshop

1 Ghz processor
CS4 - 2 GB of RAM min, CC- 2014 – 4GB, I would recommend a minimum of 4 GB RAM today
1GB of available hard drive space for installation;
1024×768 or bigger display with (24 bit video card) to support full color
An external hard drive to back up your images - 2 hard drives if the images are valuable.

These are minimum requirements,given the low cost of RAM I would recommend **8 as minimum** for CC2015 and 16 GB or more for better performance. A video card should have at least 256 MB of RAM so you can set it to display 24 bit colour (16.7 million colours). Photoshop can be a memory hog so get as much RAM as your computer can hold.

Buy the best quality monitor you can afford. Older cathode ray (CRT) television style monitors are disappearing so you will most likely be looking at purchasing an LCD (liquid crystal display) flat panel monitor. High gloss screens look great inside but not outside - if possible opt for the matte screen option. Also try to view some pictures on the monitor before purchasing it and read reviews on the web. After the purchase of your camera, your monitor is one of the most important items as you will be making decisions about your pictures based on what you see on it. If you plan to do a lot editing in front of your monitor buy the biggest monitor you can afford. Other monitor factors to consider are the brightness, refresh rate and optimum viewing angle.

Mac versus PC. For many folks it will come down to a personal decision or financial one. Unless you have a specific preference, buy whatever your friends have as no matter what computer you use you will need help from time to time. Photoshop is available for both systems. The screen shots in this workshop are from the PC. When following tutorials on a Mac substitute the **Ctrl Key on Windows** for **Cmd** key on Mac and **Alt** key Windows for **Opt** key on the Mac.

Image Editing Software What you purchase and use will depend on how much control you wish to have over the image editing process, how much time you are willing to invest learning the software and what you can afford to pay. Photoshop is the best image editing program on the planet today, it is used widely in photography, graphic design, and in the movie industry. There are a wide range of learning resources, including courses, books and videos to help you learn Photoshop. If you take your photography seriously, then Photoshop can help you make your images the best they can be. It takes time to master this Photoshop, but the good news is that you can learn the most essential features in a few days especially if you have a knowledgeable instructor walk you through the various steps and a recipe manual like this one.

A selection of image editing programs include:

1) Adobe Photoshop CC – best available today, cost $12.95\month subscription based .
2) Adobe Photoshop Elements – 3 levels, beginner, intermediate and advanced modes.
3) GIMP – free and available for Mac, PC and Unix computers – few learning resources.
4) Nikon Capture software –vadequate for some users.
5) Adobe Lightroom –easier to learn, no layers, limited features compared to Photoshop.
6) Picasa - **free** and available for both Mac and PC – recommended as an image database.

Adobe Elements offers many features found in the full version of Photoshop, has extensive help menus and is easy to learn – for some photographers this may be all they ever need. Many of the techniques described in this book can be applied to Elements though the location of the menus will be different. Another excellent image editing program is GIMP and it is totally free. GIMP stands for **G**eneral Image **M**anipulation **P**rogram and has been under development since 1995 and although it is not as feature rich as Photoshop it supports RAW files and is the best free image editing program available. Adobe Lightroom offers basic editing capabilities and there is less to learn, but I find its capabilities are limited and redundant but the good news is it comes free with Photoshop CC – CLOUD subscription. Renting software has advantages and disadvantages, the initial cost is low, but we must make payments to Adobe for as long as we use the program and they can raise the cost anytime they like.

Picasa is a free program available from Google that serves as a simple image editing program and a powerful image database. It is available for PC and Mac. Picasa will find the images on your hard drive and display them including your RAW files, movies and other graphic files. It can also be used to create screensavers, collages, and even movies. It is a must have program for any photographer and it's free. I use its' image database feature daily to locate images on my hard drive, and after locating an image I select it and open in Photoshop to edit or preview. I also use Picasa to edit and present slide shows.

Printers

Choosing a colour printer is a bit like choosing a camera, everyone has their favorites. I find the Epson colour printers to offer the best quality and value. Epson also offers the wide range of paper types though you can use other paper brands e.g. [Hahnemuhle.](#) Epson was the first to produce a printer with archive quality inks that lasting more than 50 years, an important feature if you wish to sell your prints as art. Canon, Kodak and others also make excellent printers. My advice is to go to a shop that sells printers that will show you sample prints from each printer. Note if you plan on printing black and white – look for printers that offer separate ink cartridges including black and gray – some printers are specialized for black and white printing. The more black tones your printer has the better but recent Epson printers do a very good job of BW (e.g. Epson Stylus Photo 2880 and does up to 13 x 19 inch prints). The downside of inkjet printers is that ink and certain papers can be expensive so I sometimes I take my digital files to be commercially printed (London Drugs is economical and does a fine job).

Scanners

If you own negatives, slides or prints and you want to digitize them you will need a scanner. Flat bed scanners can be purchased for about $100-600. Some flatbed scanners also scan negatives and slides (e.g. Epson V250, V600, and only cost $249 and comes with Photoshop Elements 12). If you own thousands of slides then investing in a slide scanner is a good idea but slide scanners are disappearing. If you only shoot with a digital camera then I would recommend investing in an all purpose scanner that scans prints, slides and negatives. Things to look for in a quality scanner

are bit depth (24 bits colour or greater), dynamic range 3.6 to 4.2 is the best available. Look for featyres such as dust removal and multi-scanning capabilities. Multi-scanning is particularly useful for slides with large dark areas which tend have a lot of digital noise. Multi-scanning is a feature that scans the slide several times and averages the data resulting in lower digital noise. If you have a lot of slides or negatives to scan also look for a scanner that can scan a large file quickly (90 seconds or less) or you will be sitting in front of your scanner for days! I would recommend the Nikon or Canon slide scanners and Epson Flat bed scanners.

Colour Management

The main goal in printing your images is to achieve prints that come as close as possible to the images we see on our computer screen. In order to achieve this we need to calibrate the monitor and use a colour management system. Adobe Photoshop can be your colour management system. Keep in mind that images on paper can never be as brilliant or saturated as those we see on a monitor or a slide because transmitted light will always appear more brilliant then reflected light.
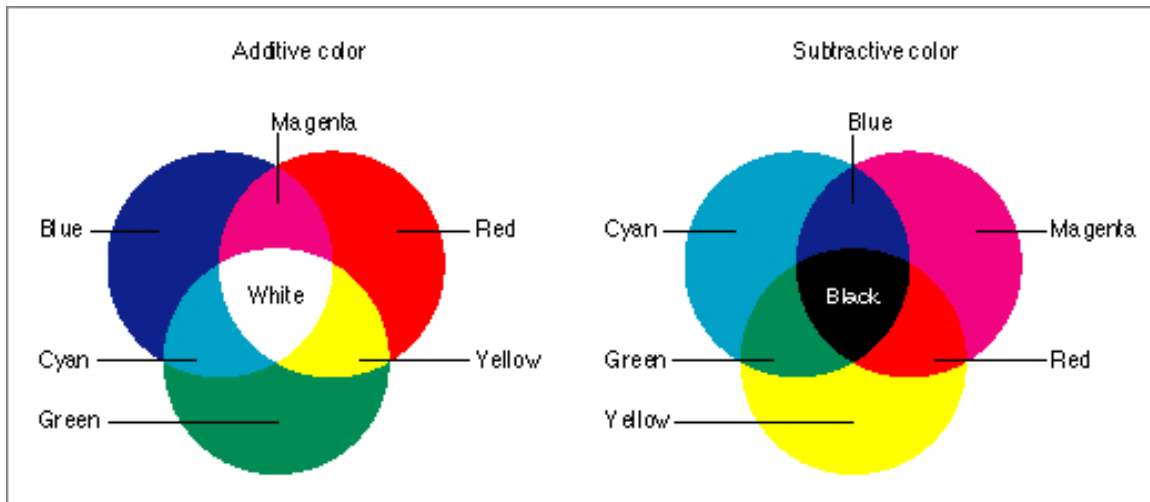
Additive colours Red, Green and Blue are used on computer monitors to produce the array of colours we see. Subtractive colours are used when printing and are referred to as CYMK for Cyan, Yellow, Magenta and Black. The range of colours in RGB and CYMK modes are slightly different and colour on prints cannot appear as pure or saturated as those on a monitor or slide.

Colour Space

In order to work with colour and produce consistent results scientists have developed models to describe and quantify colour. A colour space is simply a model that describes the various colours that can be seen or produced by a particular device such as a camera, monitor or printer. The LAB colour space represents the largest range of colours that the average human eye can see and all other colour spaces are smaller and fit inside this one (see below).
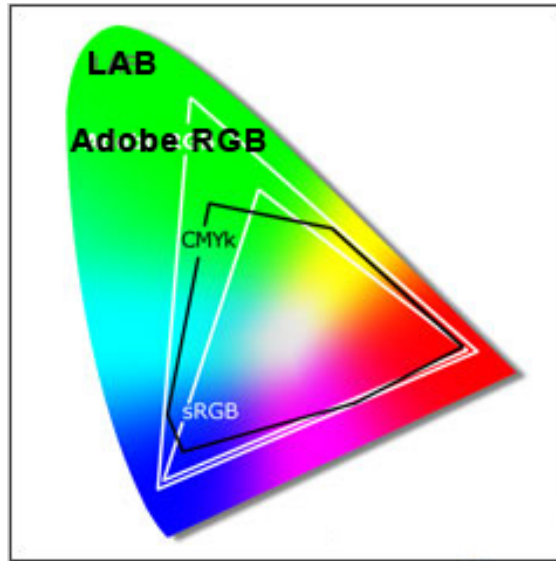
The **Adobe RGB** colour space is smaller than LAB and both the **sRGB** and **CYMK** colour spaces are smaller yet. The smaller the space the fewer colours it contains. One of the main problems with producing consistent colour when using digital devices is that each device has a unique range of colours it can produce called a **colour gamut**. As we move the image from one device to another the colour gamut usually gets smaller and some colours may not exist in the new device e.g. printer. By creating a colour profile that describes the range of colours a device can reproduce, converting images from one device to another using a colour management system (Adobe Photoshop) it's possible to get more consistent and predictable colour and that is what colour management is all about. .Be sure to set your camera to Adobe RGB if you are using Photoshop for editing your images in Adobe RGB mode and configure Photohshop to work in Adobe RGB mode.

The computer monitor is the most important component in the chain of your digital workflow. Therefore you only need to calibrate and profile your monitor in order to produce consistent and predictable results. Also it's important to set your camera colour space and Photoshop's both to Adobe RGB.

Calibrating your Monitor

Monitors come in two basic types, cathode ray tube or CRT and liquid crystal display or LCD. Some experts claim that CRT monitors are better for critical colour correction work and they are easier to calibrate – this may be true, but the reality is that CRT monitors are almost extinct. LCD screens are lighter in weight, cheaper to manufacture and draw less power. LCD monitors have improved greatly in quality and features and many professionals are using them with good results. Do not buy the cheapest monitor you can find. Laptop monitors are generally more difficult to calibrate and some of them frankly can't be calibrated. in order for your monitor to accurately represent images that you print you will need to produce a monitor profile and configure Photoshop to use the profile as described below. Is it critical to calibrate your monitor? If you shoot professionally then yes it is, if you shoot for your own use and are not as critical as some of my clients then you may not need to unless you are unhappy with your prints.

Room Lighting

The placement of your monitor with respect to other room lights and the overall room lighting conditions are important. Don't put your computer monitor near windows, or directly underneath a bright light. If you do have your computer in front of a large window then make sure you have blinds or drapes that allow you to darken the room when you are doing colour correction and other image editing procedures. Generally speaking rooms with low light levels are best for image editing. If the lighting where your computer is stationed changes drastically throughout the day then this may make it more difficult to achieve consistent results. The light source that you evaluate your prints is also important, Epson recommends using tungsten light, other printer manufacturers may recommend using a daylight bulb (5500 to 6500 °K) when viewing your prints always consider the type of lighting you plan to use when displaying your print.

Colour Spectrophotometer and Software

The best way to calibrate you monitor is to use a combination software and hardware device (spectrophotometer) sometimes referred to as a colour spyder. There are number of products available in the $100-$300 range that do a good job. Colour spyders are available at most professional camera stores and camera departments. I use the color Spyder 3 pro (now version 4 available). Basically you install the software on the CD included, plug in your spyder to the USB and follow the instructions. The process takes about 10 minutes and when you are done you save the colour profile created onto your computer. The final step is to configure Photoshop to use the monitor profile you created (described on page 8). With LCD monitors I recalibrate them about every 6-12 months. The software also can be installed on several computers so you only need one kit to calibrate all the computers you may own.

Two things you need to know is what to set the white point to and what to set the gamma. Se the white point to **6500 °K** – colour of your whites and set your monitor **gamma to 2.2 –it affects the monitor contrast.** When you are done save the colour profile – I like to include my name and date in the file name e.g. **rberdanNov22.icm**. This profile will be saved as an .icm file which is simply a text file that describes the characteristics of your monitor. When the computer starts it loads the color profile automatically, you may see screen get a little lighter or darker when the profile loads. Then configure Photoshop to use this custom colour profile (as described below) to get the best results.

monitor_calibration.mov

Photoshop Colour Configuration Settings

Most people that start up Photoshop for the first time do not realize that the colour settings are optimized for the web and not for printing. By default, adobe Photoshop is set to **sRGB** colour space. Adobe defaults to sRGB because they realize that most folks do not calibrate their monitors and hence images produced in an sRGB colour space will tend to look more saturated. Most digital cameras are also set to the **sRGB** colour space by default for the same reason and JPG files are usually created in this smaller colour space. If you plan to use Photoshop primarily for adjusting your image to make prints then configuring Photoshop to an Adobe RGB colour space will provide the best result. You should also set your digital camera to Adobe RGB colour space if you shoot RAW files. If you also save files for the web you can convert them to sRGB when you save them. One last point to note is that when you update Photoshop it often resets the colour configuration settings back to the default values. If you update the software – check the

colour settings and reset them if necessary. When Photoshop Cloud updates to a new version of Photoshop it over writes the older version of Photoshop and will lose plugins and extra extensions you added – I find this annoying.

To set your Colour Settings in Photoshop for making prints select **Edit > colour settings**. (You can do this anytime) but preferably after calibrating your monitor. Initially the box will look like the image below (in CS4 – CS6). Select more options button on the right and fill out the boxes as shown in the second box below so Photoshop uses your monitor colour profile. You should calibrate your monitor first before you set up color settings.
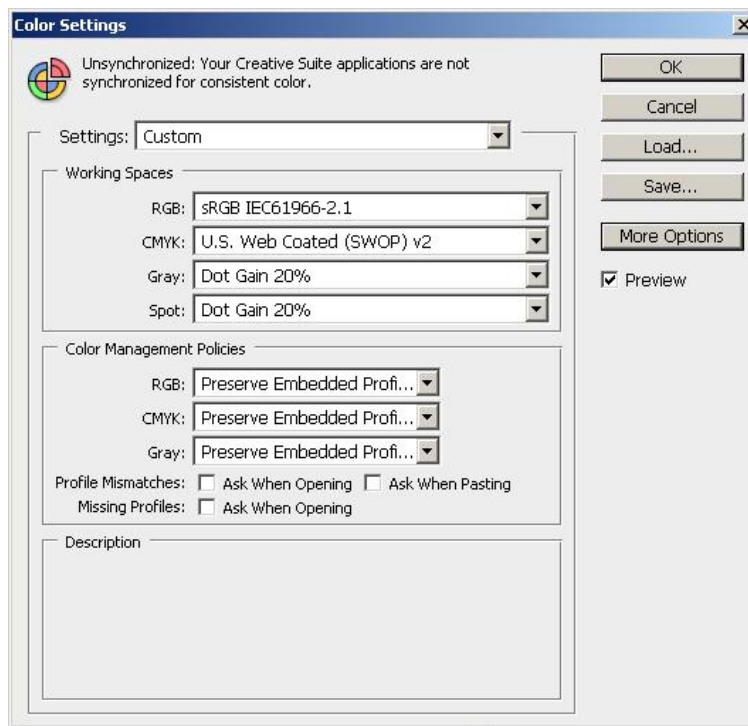
Above Photoshop's Default Colour Settings in CS4 - these settings are OK for creating pictures for display on the World Wide Web but are not ideal for making prints. See CC2015 pop up box below. Change sRGB mode to Adobe, GraY: to Gamma to 2.2, select all the check boxes in Colour management and under Conversion options – select all the checkboxes to turn these features on – they provide warnings when working with images that have different color profiles.
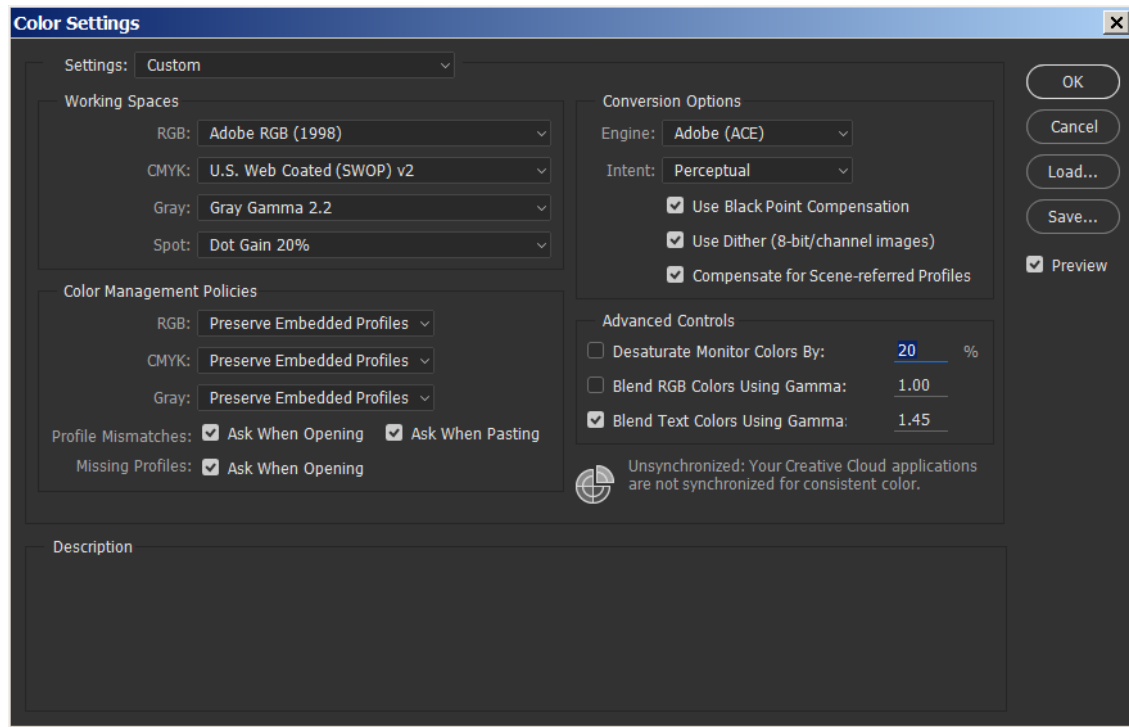
Screen shot for Color Settings pop popup box for Photoshop CC 2015.1 – make your settings the same as those above – under rendering Intent on the right – you may wish to leave it at the default setting – relative colourmetric for people photography, but for landscape and nature I find perceptual rendering intent results in slightly more saturated prints – intents are described below. Make sure all checkboxes I have selected above are checked.

See coloursettings.mov

Rendering Intents – What are they?

When we move images from one colour space (device – camera, monitor, printer) to another they need to be converted into the new devices colour space. The rendering intent determines what happens to the colours that are outside the color gamut – some are thrown away or modified.

Perceptual intent is recommended for images where you have many out of gamut colours (highly saturated colours e.g autumn leaves). This rendering intent attempts to compress the gamut of the target space (document profile) so that the overall image appearance is preserved –though all the colours in the image may change slightly in lightness and saturation. This is my preference for nature photography as it makes green, reds, yellows appear slightly more saturated.

Relative Colourimetric intent maps the white in the source to the white in the target i.e. your paper. It reproduces all the in-gamut-colours exactly but clips (throws away) out-of-gamut colours and instead chooses the closest reproducible hue. This rendering intent is best suited for images that don't contain significant out-of-gamut colours and may be a better choice than perceptual because it preserves more of the original coloursI recommend this rendering intent of portrait and wedding photographers.

Saturation intent is good for pie charts where you want vivid colours without concern for hue & lightness – **do not use for printing photographs.**

Absolute Colourimetric – Similar to relative colourimetric, but does not scale white to white. **Do not use this setting for printing photographs.** If you want to understand more about colour management– see B. Fraser et. al 2005 – Color Management 2nd Ed – Peachpit Press.(for geeks only) – **do not use this rendering intent for printing photographs.**

Making a Test Print

In order to see if you are getting the expected results it's a good idea to create or use a test image. A good test image should have some neutral gray areas, a wide variety of colour and skin tones. On the CD or my web site I provide you with several test files like those shown below. Note that the colours in your prints will never look as saturated as they do on your monitor – the goal is to make certain the white, black and gray areas are neutral and there are no traces of colour in them. If you test print looks good – then your system is calibrated and you should be able to get good prints from your favourite pictures. I will provide a test image for you to use.

Test files like those above are provided by some web sites and software companies and should be used to test your colour printer before you start printing your own photos. The image on the left is from PhotoDisc, Inc., the one of the right is from earlier version of Adobe Photoshop. When you print these images look for any hint of colour in the gray areas - if there isn't any and the prints look similar to the test images on your computer you are good to go.

Note each printer has different controls and settings – if the printer has a print preview, then select this option as it uses the monitor profile, your printer outputs a simulated print on the screen and it should be used to judge before you actually print the image. If the simulated picture does not look good – then close the window and make some adjustments before sending the file to the printer. Keep notes as to what the best printer settings are so you can repeat your results in the future and save money on ink and paper. We used to keep notes as well when working in a traditional darkroom as different batches of colour paper had different colour properties.

How to Calculate the file size required for making colour prints

Size of print you can make is determined in part by the number of Mega pixels (MP)

Number of Mega pixels (MP)   **Approximate size of print you can make**

1 MP   4 x 6 to 5 x 7 inches
2 MP   5 x 7 to 8 x 10 inches
3 MP   8 x 10 (11 x 14 inches in RAW mode)
6 MP   11 x 14 to 20 x 24 inches (approaches resolution of film)
12 MP   30 x 40 inches or more (exceeds the resolution of 35 mm film)

Other factors that determine how large a print you can make include optical quality of the lens, did you use a tripod, the camera sensor size, lighting, ISO setting, and skill with software. Cameras with larger sensors like SLRs (**s**ingle **l**ens **r**eflex) cameras will produce higher quality prints compared to a compact cameras with the same number of mega pixels.


Setting the Print Resolution

My advice is simply choose the highest resolution or quality setting on your printer can output when making prints for presentation or sale. The important feature is to set the number of pixels per inch or dots per inch in your image file in Photoshop to between 200-300 dpi or ppi - pixels per inch (ppi or dpi). Most quality magazines, book photos, brochures etc. use 300 dpi images as t the standard and that is the resolution I use in my prints and magazine submissions.

Formula to determine how many mega pixels you need to make a specific size print

(Length inches x width inches x image dpi² x 3 (RGB))/ 1, 048,576 = File Size in Megabytes
8 bits (0 or 1) = byte; 1024 bytes = I kilobyte; 1,048,576 = I Megabyte, multiply by 3 for RGB color

e.g. for a 10 x 15 inch print (8 bit colour)
(10 x 15 x 300 dpi x 300 dpi x 3)/1,048,576 = 39 Megabytes

360 ppi   300 ppi   200 ppi   100 ppi   50 ppi
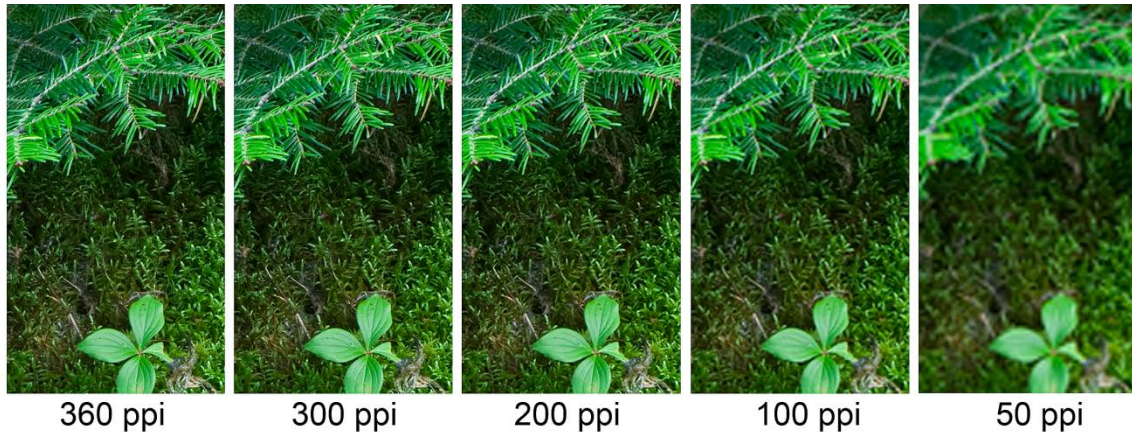
Images at different resolutions - the differences are more apparent if you were to make test prints from images at these different resolutions. 50 and 100 ppi appear pixilated whereas images over 200 ppi generally look good with 300 ppi being a good balance between quality and file size.

I recommend using 300 ppi (pixels per inch) for printing as this is what most book and magazine publishers require. It is however, possible to get good quality prints at 200 ppi and the files sizes are smaller. Larger files will take longer to print and require more space to store. If quality is your main concern you should set your print to print your images at 300 ppi (dpi – printer output, ppi

setting in Photoshop). Note the default camera resolution is 72 dpi so make sure you check your image resolution in Photoshop before you make your print.
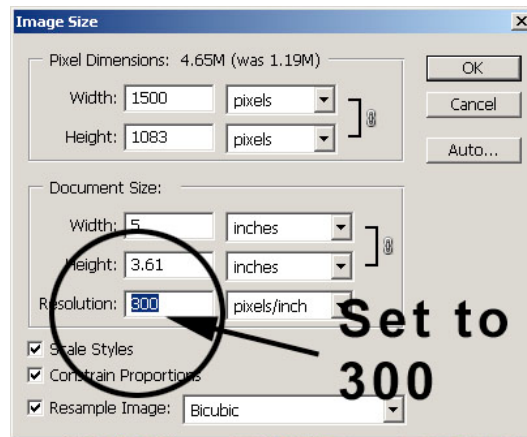
Photoshop Select > Image > Image size and set the resolution to **300 ppi** for making quality prints. For web images we often leave the resolution at **72 ppi .** Also when saving your image for the web select File > Save for Web & Devices - choose .jpg file, check convert to sRGB and set the quality > OK. In newer versions of Photoshop you select File > Export > Save for Web (legacy)> check – convert to sRGB and set the compression quality and file type (.jpg).

What is a Digital Work Flow?

A workflow is a series of steps used to adjust tones, colour-correct and prepare digital images for making prints or for displaying them on a computer. Your workflow will vary with the images your import and will depend on what corrections are required. With practice most images only need a few minutes to fix and optimize them them for printing.

Your workflow will depend on whether you are working on a JPG file or RAW file. RAW files require a few additional steps and then the process becomes the same as that for JPG file. If all your images are exposed under the same lighting conditions you can also batch process several RAW images at the same time. The workflow steps described here should be considered as a starting point on which to create your own and keep in mind that some images may not need certain adjustments or fixes.

Basic steps for processing JPG or TIF files and making a print

1. Open the image file – check the size and resolution – crop if necessary.
2. Adjust the images size for final output set it to 300 dpi for prints
3. Optimize the tones in the image using the levels histogram.
4. Colour correct the image using autocolour or curves and colour correct a gray area.
5. Inspect image for dust spots that may have been on the sensor
6. Darken, lighten or saturate specific areas of your image.
7. Adjust the overall colour saturation or convert image to black and white.
8. Sharpen the image with unsharp mask (last step after you do any kind of resizing).
9. Add border, apply any filters, text, signature and\or copyright information.
10. Check image is in 8 bit mode (JPGs will be, RAW usually 16 bit mode – convert to 8 bit).
11. Save and name the file, choose either TIF format (uncompressed) for maximum print quality, JPG if you need a smaller file size or need to email the file e.g. to a magazine editor. Most email programs are limited to a maximum of 5 MB (Megabytes).

Before working with Photoshop you need to know there are several ways to open files. Also you should know where to find Photoshop's **HELP** (top right) to find information about specific tools and features. If you don't own Photoshop you can download a 30 day free trial version from: http://www.photoshopsupport.com/photoshop-cs4/photoshop-11-free-trial.html. If you purchase a subscription of Photoshop and Lightroom be sure to also download **Adobe Bridge** with comes with these two programs – it's a separate download. Bridge lets you find and preview files and does much more. Finally – if you can't find something – ask **GOOGLE** – chances are that someone else has asked the same question before and the answer is online. Still can't find an answer? **CALL ADOBE PHOTOSHOP SUPPORT 1-800-833-6687 – but you need to be subscriber to get their assistance. With your permission they can access your computer after you download a utility and fix it remotely - I like that feature.**

To know if you have the lastest version of Photoshop and Camera RAW check Adobe's web site: https://helpx.adobe.com/photoshop/kb/uptodate.html#CheckUpdates

Note Photoshop CC requires **Windows 7 or newer** to be installed and on the Mac OS X v10.9, v10.10 (64-bit), or v10.11 (64-bit) see: https://helpx.adobe.com/photoshop/system-requirements.html for latest information on Adobe Photoshop requirements.

Processing RAW files in Adobe Camera RAW (ACR)

Adobe Camera Raw (ACR) is a feature built into Photoshop. The program allows you to edit, -re-size and manipulate your camera RAW files before you open them in Photoshop. As new cameras become available these cameras may use newer versions of RAW files that cannot be opened until Adobe updates their software – with a cloud subscription this is done frequently. If you can't open a certain RAW file, try to update your camera RAW by selecting **Help > Updates** and see if there is an update available to download and then try again. If you are using an older version of Photoshop unfortunately you will have to upgrade to the newer version of Photoshop to open the latest RAW files. If your camera shoots a generic .DNG RAW file – only a few cameras do – you should be able to open the file with most recent versions of Photoshop. Adobe also offers a RAW file to DNG converter you can try. Another alternative is to use software from your camera company e.g. Nikon or Canon and convert the RAW file to a TIF then open in an older version of Photoshop, but this defeats the advantages of shooting in RAW format. The basic workflow steps for working with RAW files are:

1. Open the RAW file - adjust the filesize, resolution, bit depth and colour space in ACR.
2. Optimize the exposure.
3. Adjust the white balance.
4. Adjust saturation, contrast, vibrance, noise reduction and other features as desired.
5. If the sky needs to be darkened you can add a gradient overlay.
6. You can reduce digital noise, fix chromatic aberration, lens distorsion, vignetting etc
7. Click OK to view in Photoshop – start processing your file as you would a JPG file.

Adobe Camera RAW can do more and there are even entire books on Camera RAW, I will cover the most frequently used features and you can explore the curves, presets etc on your own.

## How to Open Image Files in Photoshop

There are several ways to do this. **1) File > open** navigate to the folder with your images are and select the image file you want to open, This method works best when loading files from a CD or DVD and is fast. In the open box you can select to view files as a list or thumbnails (see below).
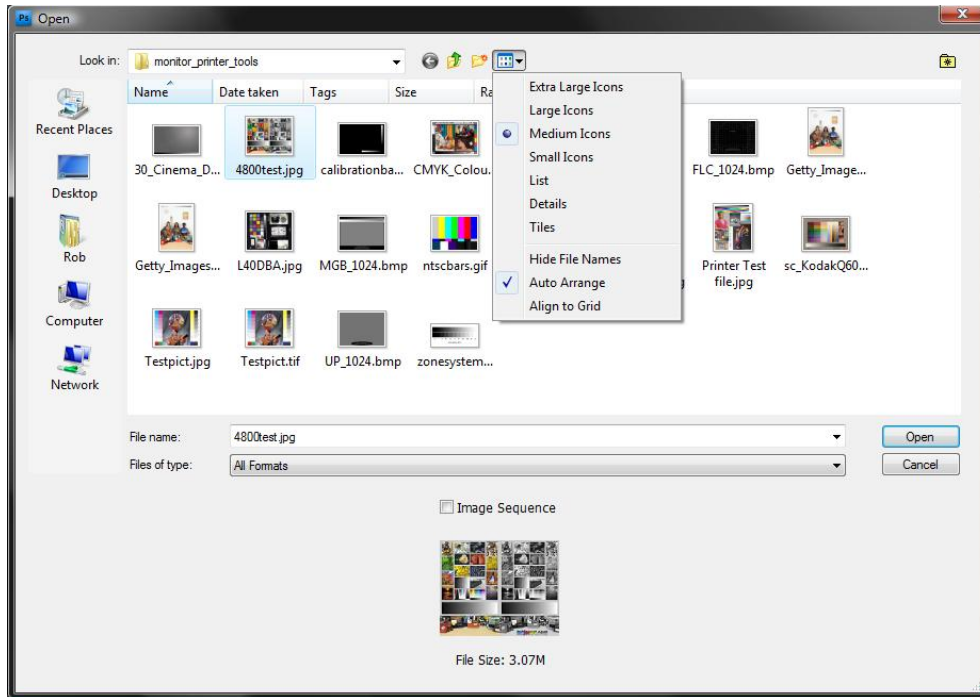
2) Select File > Browse in Bridge - I have Essentials selected at the top of Bridge. You will have to navigate to the folder with your images and then view the thumbnails in the main window - double click on an image file to open it in Photoshop. If you double click on a RAW file, it will first open in Adobe Camera RAW. You can also simply drag the files from Bridge into Photoshop.
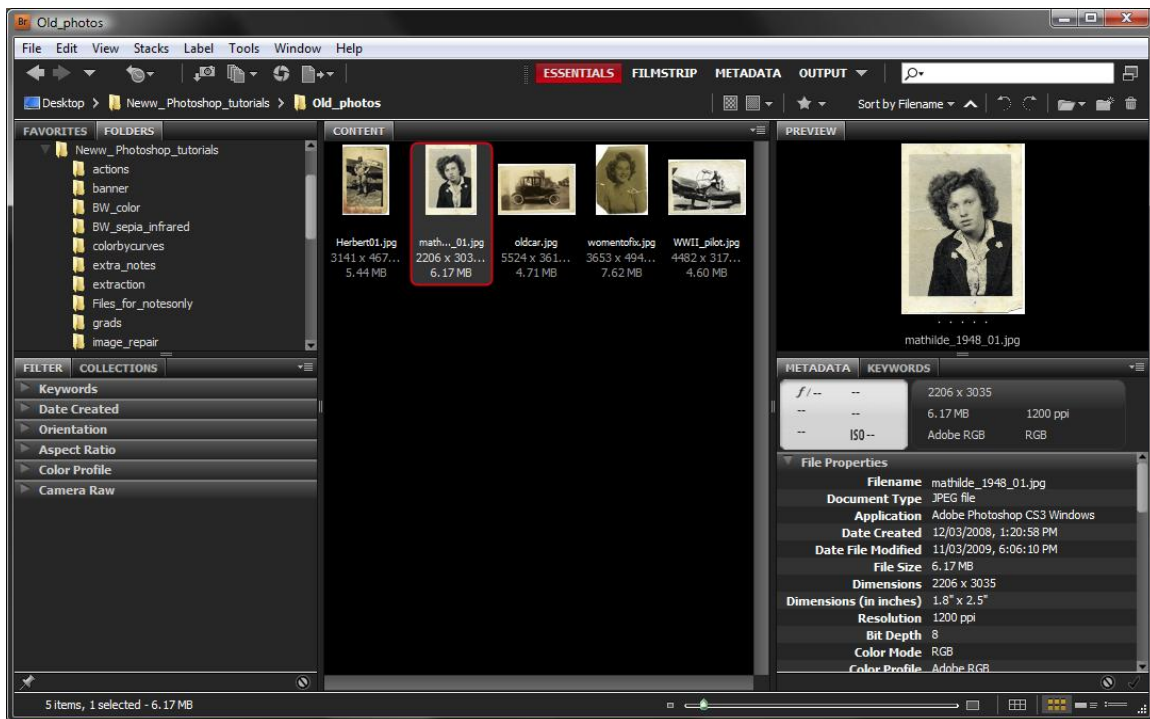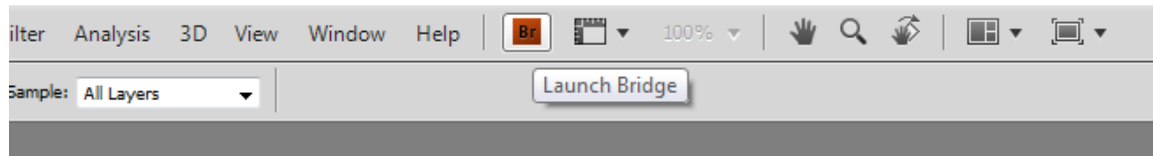
You can also Launch Adobe Bridge by selecting the Launch Bridge Button at the top of Photoshop (in **Photoshop CS5 only** – other versions of Photoshop File > Browse in Bridge)

 3) The third way to open files in Photoshop is to have Photoshop open, select your folder, open the folder then drag the image file into Photoshop. Beware if you already have an image open it may place the new image inside the older image unless you undock the first image so it's floating in the window and not docked to the top.

4**) A fourth way on a PC is right click on the image file select > Open in > Photoshop –** I usually locate my images using Picassa then right click and open the file in Photoshop. This allows me to find and open files that I have in my image data base.

If you don't see thumbnail views for your RAW files you may have to upgrade Photoshop to get the latest RAW converter - to do this select the Help menu at the top > Updates and Photoshop will check if there are any updates and if so it will download and install them. If you still don't see the RAW files you may need to upgrade your version of Photoshop if using a version before CC.

Digital Workflow - we will start by opening a RAW file, adjust exposure, white balance, saturation, size and bit depth - then open the file in Photoshop and make further adjustments including colour correction, resize, burn, dodge, paint with the sponge tool, add a border and save it as .TIF file for printing. If you are starting with a JPG or TIF file - the steps will essentially be the same once the file is open in Photoshop.

A feature in Photoshop CC 2015 is that you can open a JPG or TIF file, then select **Filter > Camera RAW filter** – and the image opens in Adobe Camera RAW allowing you to make adjustments to the exposure, white balance and apply other fixes that Camera RAW permits.

 See openfilesCS4.mov

RAW workflow

Each camera manufacturer offers its own proprietary RAW file format and file extension. RAW files also differ even from the same manufacturer on different camera models. A few cameras can create a generic RAW format the **Digital Negative Format** with the file extension .**dng.** You can convert any RAW format into .DNG format using Adobe Camera RAW by selecting Save Image in the lower left of the Adobe Camera Raw (ACR) window and download a separate converter from Adobe. To find out what cameras are currently supported by ACR check out Adobe's web site: http://www.adobe.com/products/Photoshop/cameraraw.html. (Note Adobe Lightroom uses the same Adobe Camera RAW engine to open RAW files and also needs to be updated periodically).


1. Select Adobe Bridge and navigate to the Photoshop tutorials folder and select the RAW folder.

2. With the thumbnails displayed, select and double click on Morning.NEF a picture of Robert first thing in the morning with his Nikon Camera. Before we correct the white balance we will set the default ACR settings. At the bottom of the picture you can see a blue hyper link - click on it

and ensure the settings are set to: **Space: AdobeRGB (1988); Depth 16 bits; Size 12.2 MP** - note you can enlarge the file sizes significantly with very little noticeable degradation. Set Resolution to 300 ppi and leave the other settings at their default. You can also upsize your image even more inside of Photoshop using the resize feature – I have upsized 12 Megapixel image files to 12 GB in order to make prints 19 x 9 feet suitable for billboards or a museum backdrop with pretty decent results. Enlarging the RAW file seems to provide better enlargments that upsizing a .JPG or .TIF file.
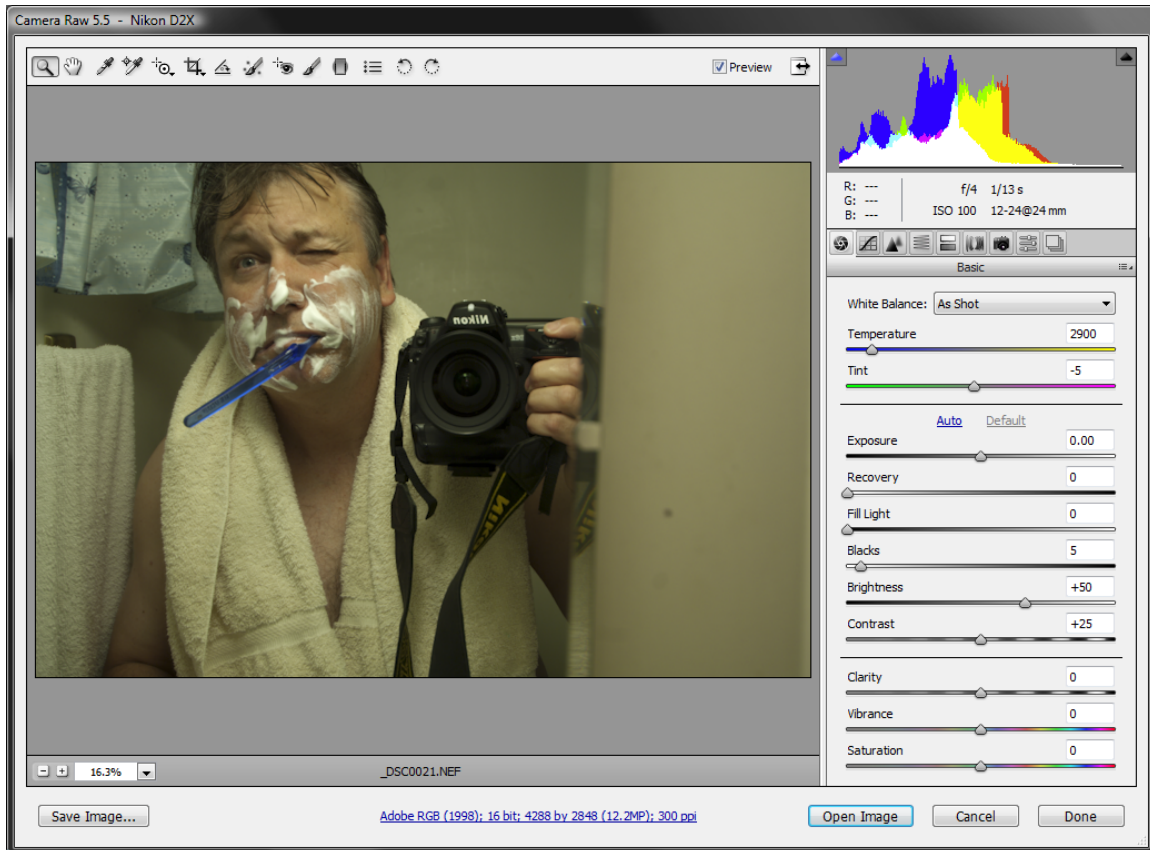

3. Above in ACR the picture is surrounded by a large number of controls on the right and the top.

4. Select the exposure slider and move it to the right or left and notice how you can change a pictures exposure. This is a very powerful feature, but if your picture is very overexposed with blown out highlights you may not be able to recover them. Move the exposure to about +1.0 which is equivalent to 1 F-stop increase in exposure. Because it is possible to alter exposure after taking a picture in RAW format there it's not necessary to bracket photo exposures (unless you are making HDR photos). Bracketing involved taking several shots at different exposures. With slide film bracketing was common to ensure an image with a perfect exposure.

5. Next we will fix the white balance or color cast. There are three ways to do this. A) Select white balance drop down menu on the right and select the different options e.g. Auto, daylight etc and note how the white balance changes. Usually auto gives the best result. 2) you can adjust the tint slider (monitor must be calibrated for this to work properly) or 3) Select the white balance tool – eyedropper 3rd from top left of the screen and click on a light tone (e.g. the wall) and it will set the proper white balance for the photo. I will show you how to measure if the area is white – using the color balance too. This tool shows three numbers for RGB and they should all be about the same e.g. 15,15,15. If you have a neutral white or gray card in the pictures you could click on it and the RGB values should be approximately equal. This eliminates any

"subjectivity". I will demo the white balance tool – it's very easy to use to correct the white balance if ithe photographed under tungsten or fluorescent lighting it will correct it.
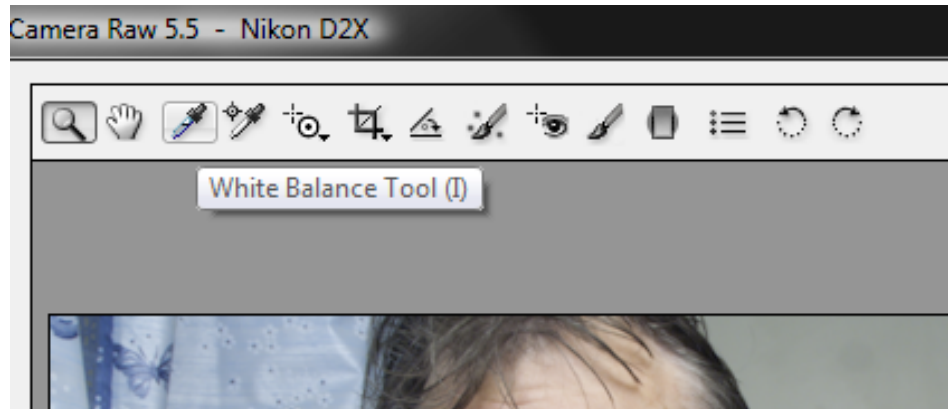
Above -select the white balance tool and click over an area that should be neutral like the wall to the right. Do not select very bright or very dark areas.
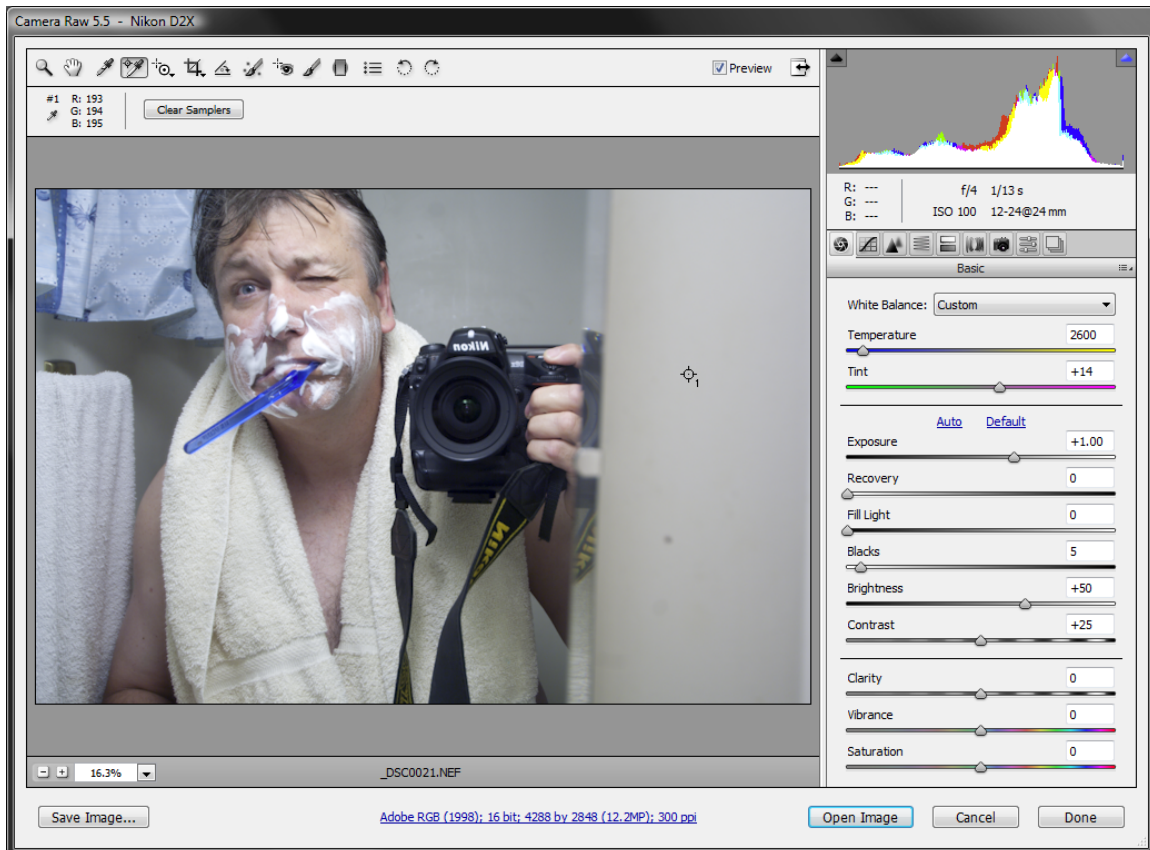
Click the eyedropper with cross above it over the wall and note the RGB numbers when they are all equal or very close - as shown R 193, G 194, B 195 your picture should have a proper white balance. When you are done select > Open image at the bottom right of ACR window. From within Photoshop you can continue to make additional adjustments.

When you start out with ACR concentrate on the main controls before you begin to explore the more advanced features. In this workshop we will briefly explore some of the advanced features such as highlights, shadows, clarity, noise reduction, and fixing chromatic aberration.

See cameraraw1.move

MORE RAW FILE EXAMPLES – Preparing for making a print

1. Select the RAW file folder and open image _DSC0003.NEF - a photo of close-up filters on a white background. Note the strong color cast in this example. Select the white balance tool and click somewhere on the white background - that should neutralize and set a proper white balance. Then adjust exposure to +1.75 to make the background lighter in tone and then click to open the file in Photoshop.

2. If we wanted to make a 9 x 6 inch print we need to resize the image. In Photoshop Select Image > Size set the dimensions to 9 x 6 inches at 300 dpi and click OK.
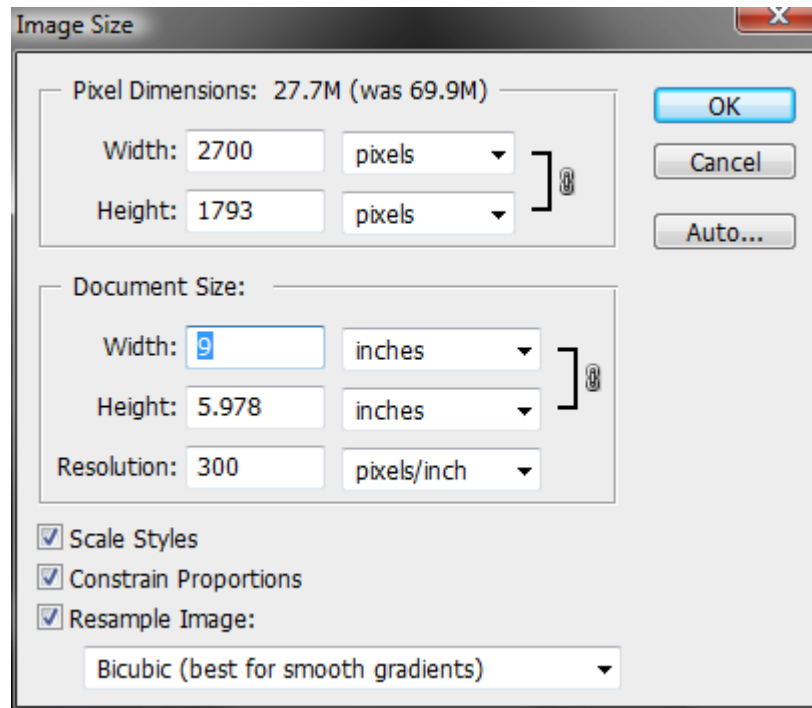
Resize your Image to make a 9 x 6 inch print at 300 dpi.

3. Since the image should look pretty good at this point - we just need to reduce the bit depth from 16 to 8 bits, sharpen the image and save it as a TIF file. To do this Select > Image > mode > 8 bits per channel. It is best to edit your images in 16 bit mode and then convert to 8 bit mode before you save your files as only a few programs support 16 bit image files. Sharpening your image should usually be the last step in your workflow or after you resize your image. To Sharpen the image select **Filter > Sharpen > Unsharp Mask**.

4. Set Threshold to 0, Radius between 0.5 and 1.5 and drag the amount slider while viewing the enlarged area in the window. Be careful not to over sharpen and image and create halos.

Threshold refers to how different the tones need to be in order for them to be sharpened on a scale of 0-255. Setting the threshold to zero indicates you want to sharpen all tones.

Radius - refers to the distance in pixels from each edge you have in your picture that you want to enhance the apparent sharpness. Photoshop enhances the sharpness by increasing the contrast at edges. Do not set the radius to greater than 1.5 pixels or you will start to see distinct halos around the objects in your photo.

Amount determines how dark or light the adjacent lines are next to the edges. You need to judge this visually. Most images can use some sharpening to offset softening that occurs during printing. Even images taken with a tripod can benefit from some sharpening - just don't overdo it! The window that you view the sharpen effect should be placed over critical elements like the text on the filter or the eyes of a person or animal.

There are different methods of sharpening in Photoshop I have found that the unsharp mask and smart sharpen tools offer the best results. Most procedures in Photoshop have more than one method to accomplish them, I usually opt for the most efficient method, but feel free to experiment with different methods and settle on what works best for you.
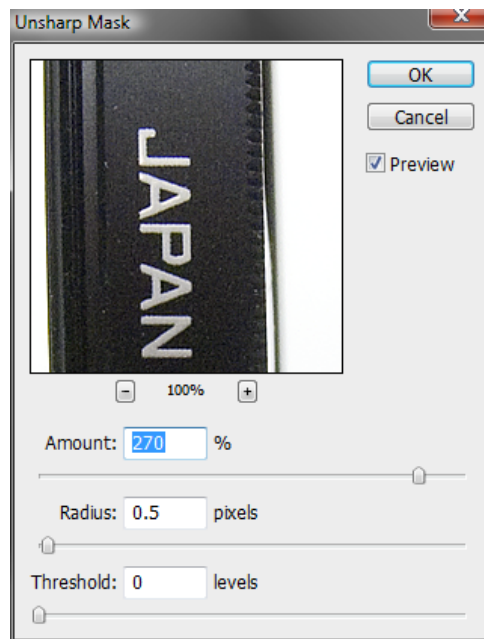

Unsharp Mask Box - this is my favourte tool for sharpening photographs.

How does the Unsharp Mask work?

The best way to demonstrate how the unsharp mask works is to apply it to an edge. I have created a box for you in the folder called monitor_printer_tools called grayboxes_forsharpening - open this file and zoom in on the edge about 1200%. Select **Filter > unsharp mask** - then begin to modify the radius and amount. The greater the radius the farther from the edge you will see a darkening effect. The greater the amount, the darker the edge becomes on side and lighter on the other. If the Threshold exceeds the difference between the white and gray tone - nothing is sharpened. Unsharp mask enhances contrast at edges and increases the apparent sharpness in an image. It's a useful tool but if your image is blurred it won't help. Photoshop CC introduced new **Shake Reduction tool** (**Filter > Sharpen > Shake reduction**) that helps sharpen images where the camera was not held steady or involved slow shutter speeds e.g. 1\8 to 1 sec. You can try it – I found the results to be disappointing and similar to simply sharpening the image.

See cameraraw2.mov
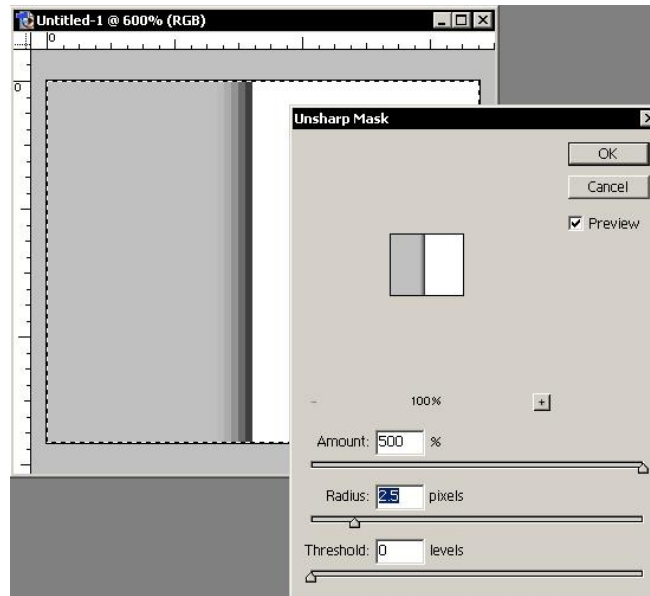
TIP – if the effect of the unsharp mask is too great you can fine tune the effect using the **Edit >
Fade Unsharp Mask** (optional step for fine tuning sharpening,).
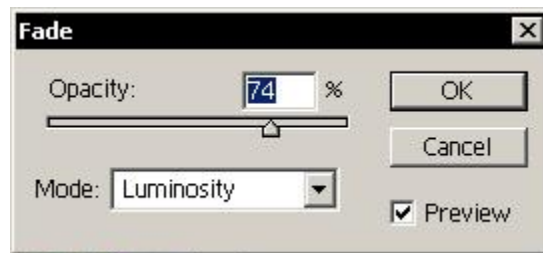
Select Luminosity from the drop down menu than adjust the strength of the Unsharp Mask. This is
recommended as one of the best ways to sharpen your images. Some folks convert their images
to Lab Mode then select the lightness layer (black and white only) and sharpen it – if the goal is
not introduce colour fringes when sharpening the pictures edges.

One of the problems with using sharpening tools is that it can also accentuate any grain,
scratches or dust on your images and also create halos. Most images will benefit from some
sharpening though the amount required will vary with the picture and the size of print you are
making. Some photos such as glamour portraits should not be sharpened unless you want to
show every wrinkle. It's also possible to sharpen specific areas of a photo using the sharpen tool
on the tools palette. Some of the other sharpening tools are better suited for use on graphics
than photos but experiment to see what works best for you.

Fixing Chromatic Aberration - Colour fringing around edges

Chromatic aberration is the inability of glass lenses to focus Red, Green and Blue wavelengths of light to exactly the same point. Lens manufacturers design lenses to minimize these aberrations but usually can't eliminate them completely. Chromatic aberration is most commonly seen with cheaper lenses and even expensive wide angle lenses near the edge of the field. Adobe Camera Raw can fix **chromatic aberration** (color fringes) around fine details like branches near the edge of a photo. To see how to do this - select the RAW folder and open the file Backyard.CR2. Zoom in on the image in the ACR window to 400% and view the tree branches on the right side of the image. You will see purple fringes around some of the branches. Select the Lens corrections tab on the right side and move the two sliders Fix Red/Cyan Fringe (-71) and Fix Blue/Yellow Fringe (about + 23) until the colour fringes are gone or minimized. Zoom out and open the image. See the chromaticaberration.mov for step by step demonstration.

See chromaticaberration.mov

Reduce Colour Noise.

ACR can also reduce colour noise in images taken at high ISO speed. Open the file _DSC0096. in the folder called **noisereduction.** Increase the exposure to +1.0 and increase the colour saturation to +30. Click on the third tab on the right side called (Detail) and in the new side panel at the bottom are controls for reducing luminance noise (noise in gray areas) and colour noise. To better see the effect of these controls zoom into the picture (200% or more) and select the area around the mother bears head. Drag the colour noise reduction slider to the right to 100 and note how the colour noise disappears. You can also experiment with the Luminance noise reduction slider but it will have less of an effect on this particular image. Luminance reduces noise in gray areas and is good for the night sky. This feature has been improved in every new edition of Photoshop.

Click on the other square tabs on the right side of ACR to reveal additional features in the Camera RAW program and you will understand why there are entire books that deal just with Adobe Photoshop camera RAW features.

See noisereduction.mov

Work Flow for JPG or TIF files

Once you open a RAW from ACR into Photoshop's main window the workflow from there on is the same as for any JPG file from your camera or TIF files imported from your scanner.

In this tutorial you are going to open an image of a Swainson's Hawk that needs to be cropped, rotated, tonal values optimized, color corrected, fix a few dust spots and finally sharpen the image. The RAW file version is also in the folder if you wish to compare workflows. Note I made the JPG image worse than the original by by tilting the photo and adding dust spots.

To undo a step in Photoshop select **Edit > Undo or** (Ctrl-Z) on PC, or you can select **Window > history >** and select earlier steps in the window that takes you back up to 22 steps.

1) Select Adobe Bridge and navigate to the folder JPGworkflow and open the image hawk.jpg

Note the image is crooked, its low in contrast, there is a colour cast and we have dirt spots we need to clean up.

2. Usually start by fixing the biggest problem first - in this case the is at an angle common in many scanned photos - we will fix it using two different methods.

a) **Select File > automate > crop and straighten image** - the image will be duplicated, rotated and the white areas trimmed from the photo. Too easy! Now let's trim the image manually using the crop tool. Select **Edit > Undo** to remove the auto crop and straighten.

b) Select the crop tool in the main toolbar and drag it around the image. You may need to zoom out so you have room to work. Place your cursor outside the top right corner and note when you press down the mouse it changes to a curved arrow. Drag your mouse and rotate the selection until the selection lines are parallel with the picture with no space between the lines and photo.

Obviously if your picture did not need to be trimmed like this you would just skip this step in the workflow.

With your mouse select and pull on the middle handles (squares) until there is no white space left around all sides. When you are done - press the ENTER key and you should be looking at a trimmed photo.

3. The next thing to check is the file size and resolution. We want to make a print 9 x 6 inches at 300 dpi. If we were to use this image for the web we would change the resolution to 72 dpi (ppi). Select Image > Image size and set the dimensions to 9 x 6 inches at 300 ppi– turn it on.

PHOTOSHOP TIP

Play with the magnifying glass to zoom in (+) and out (-) of the image - if you hold down the Alt key with the magnifying glass -zoom tool it changes to zoom out. If your mouse has a scroll button, you can configure Photoshop to zoom in and out using the scroll button on Windows. To do this go **to Edit > preferences > Tools > check Zoom with scroll wheel checkbox**. You can zoom in right down to the individual pixels that make up the image if you want to If you zoom in to see the individual pixels they may have a white border around each pixel – to remove this border **Select >View > Show > pixel grid** to unselect this feature - repeat step to turn grid back on. See enlarged view of the image below showing the pixel grid turned off and on turned on It comes down to personal preference what you like to see – I prefer the grid turned off most of the time – see picture below that shows a photo enlargement showing the individual pixels.
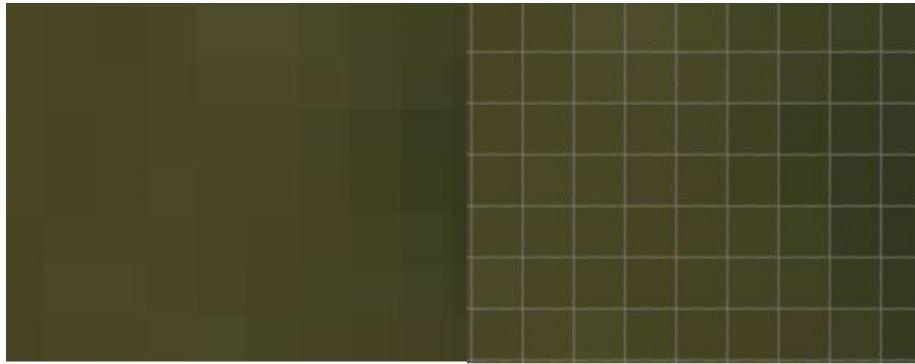
pixel grid off   pixel grid on

4. Next we will optimize the tones in the image. To do this **Select Image > adjustments > levels** to bring up a histogram showing the distribution of tones in the image. On the left are dark tones and the right are light tones or white. The height of the peaks represents the number of pixels in the image with a specific tonal value that varies from black to white. In this histogram you can see there are flat areas on the left and right which means there are no deep blacks or bright whites in the picture. You can improve the distribution of tones in many images by dragging the right slider to the left and the left most slider to the right until they meet where the histogram begins.
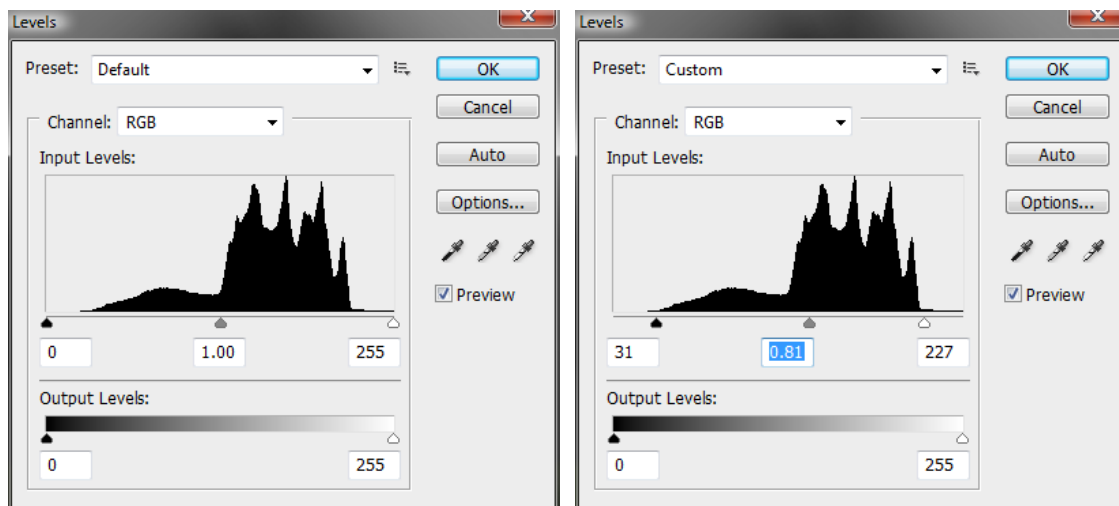
On the left is a histogram representing the opened image and on the right after moving the sliders. When you are done select OK. If you **select Image > adjustments > levels** again you will see the histogram below after you optimized the tonal range. You can improve the tonal range of many images using this tool, but beware that sometimes you many not want to do this step e.g. for photos with fog or that you want to keep the image low in contrast for artistic reasons.
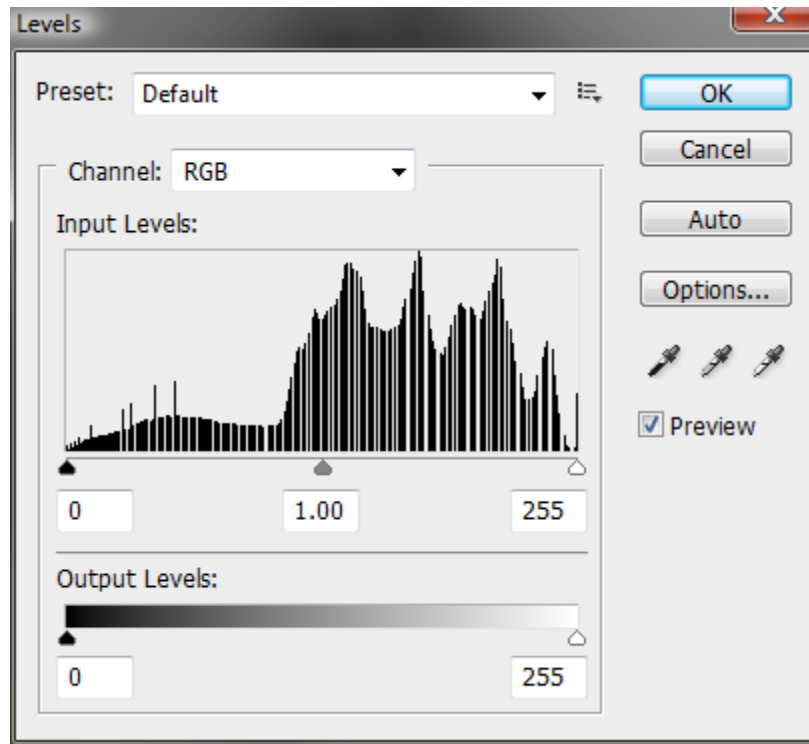
This histogram shows the redistribution of tones. The general appearance of the image should be improved – if not undue this effect.

5. Our next step will be to correct the colour cast in the image. The image has an overall yellow cast. You can easily determine the colour cast in an image by selecting the eye dropper tool and opening the info palette (Window > info). With the eyedropper selected go to the top of Photoshop and set the sample size to 3 x 3 - this makes for more accurate colour sampling. Place your eyedropper on a gray area in the photo. Gray is best and the fence post will work well. You should see numbers similar to: R 138 G150 B114. This indicates that blue is low compared to red and green. The opposite of blue is yellow so the image is in fact about 36 points too yellow. Red is low compared to Green by about 12 pts. The opposite of Red is Cyan so the image is also too cyan in color. In a perfectly colour corrected photo gray areas should have Red = Blue = Green or they should very close in number.

TIP when you drag the triangles at the bottom of the histogram inward, hold down the ALT key while you do this and you will see the background of the image turn black but when you reach the point where there is data or information you will see colours. This tells you not go any further or you will clip (eliminate) some of the colour.

6. To fix the colour cast **Select > Image > autocolor** you will see a colour shift - now place the eyedropper over the gray fence post again and you should see the RGB colours are much closer something like R 123 G115 B121 - if the gray areas of your image have equal values of RGB that indicates your image is properly colour corrected. We will use a more advanced technique later using the eyedropper tool later to fix adjust the RGB colors so they are very close using the curves tool.

7. Burn and Dodge tools allow you to lighten and darken specific regions of your image. These tools names come from traditional darkroom work. A stick with a circular piece of paper and the photographers hands were used to block or allow certain areas of the photographic paper to received less or more light exposure.
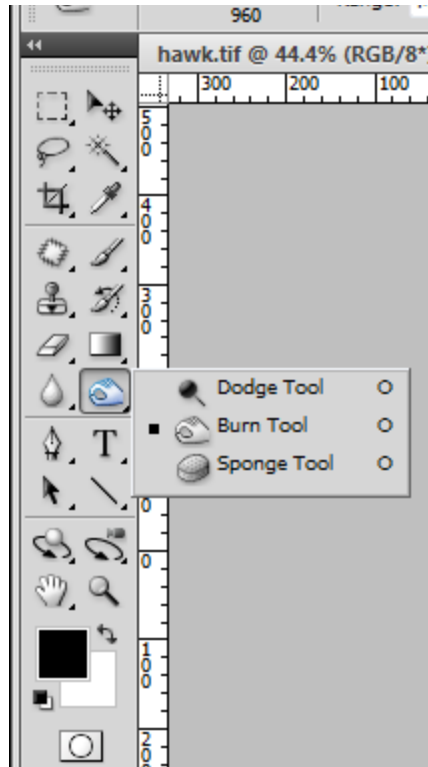
The Dodge tool will lighten an area you paint over, the Burn tool will darken and area and the Sponge tool will either increase or decrease the colour saturation over those areas you paint depending on how you have this tool mode set at the top of the Photoshop window.

Select the Dodge tool. At the top of Photoshop you can control the diameter of the tool, and the edge softness. You want to use a soft edge so set Hardness to 0% and the diameter depends on what you plan to paint over. For this picture select a diameter of about 185px and then "paint" over the birds head. As you paint you will see the tones get lighter. You can also fine tune the control by selecting the exposure at the top of the Photoshop window in the options bar - a good starting point is 50%. The lower the value the more fine control you have when "painting" with the dodge, Burn and Sponge tools. In the traditional darkroom we never had a sponge tool unfortunately.

PHOTOSHOP TIP – you can quickly increase or decrease the size of the brush, dodge, and burn tools by selecting the square left and right square brackets on your keyboard. Left bracket makes the tools smaller "[" the right bracket makes the tools larger "]".
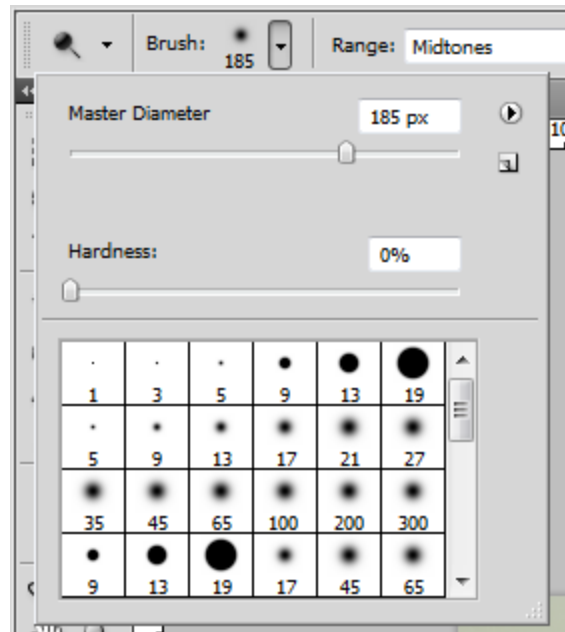
Select the Dodge tool diameter and set hardness to 0%. Below are different brush shapes you can also select.

Burning means making parts of the image darker. Select the Burn tool, set the diameter to 900 px and then paint around the outside edge of the image to darken it. Darkening around the edge of the photo results in the subject being lighter in tone and that draws the eye inward into the photo.

Finally select the sponge tool, set it to about 200px in diameter make sure the drop down menu in the top options bar is set to **saturate** and then paint over the birds beak and feathers and note how the colors become more saturated. This tool works especially well with coloured leaves or human eyes.

8. Boosting Overall colour saturation of an image. **Select Image > Adjustments > Hue & Saturation**. Select the saturation slider and move it to the right about 25-30pts and note how the background begins to increase in colour saturation. It is also possible with this control to use the drop down menu and select only a specific colour in which to modify the saturation. Be careful not to oversaturate or the image will begis to posterize and look unreal. How much too saturate is a personal decision but I find if you go to far the image does not look realistic. I try to limite a boost in saturation to between 20-30 pts. Some images you may choose to desaturate slightly - there are no fixed rules it depends on what you want colours in your image to look like. Some people like their coffee with no sugar others with three or four spoons, but remember you are trying to make your image look believable and attractive to most viewers.
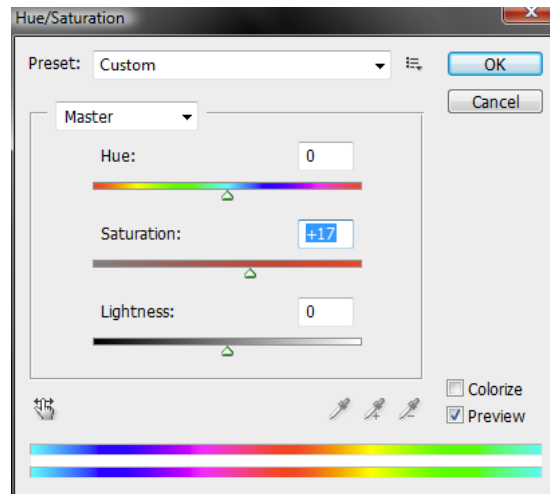
Colour saturation slide

9. Remove spots or dust that might have settled on your digital camera sensor. The easiest way to fix these is to use the spot healing Brush tool. Select it from the menu then adjust the diameter to be just a little bigger then the dust spots you are going to remove. About 90px will work well.
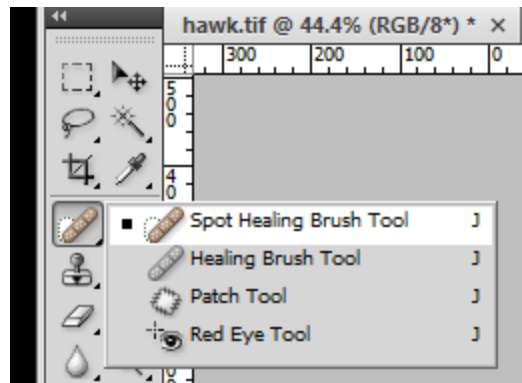

To apply the tool put it directly over a dust spot and click your mouse. The brush takes areas from around the dust spot, fills in the center and blends it to instantly remove spots. You can also paint with the tool to remove scratches. Note this tool may be elsewhere on the tool palatte in CC2015 as you can customize the tool palette in this version of Photoshop. In general if you leave your mouse hover over a tool a small tool tip will appear telling you what the tool is.

10.To put your name on the image select the T or Text tool. Then at the bottom of the tools menu - select the top square to pop up the foreground color picker.

 - Select the black square or top square,you will see the color picker, select the color you want the font to be.
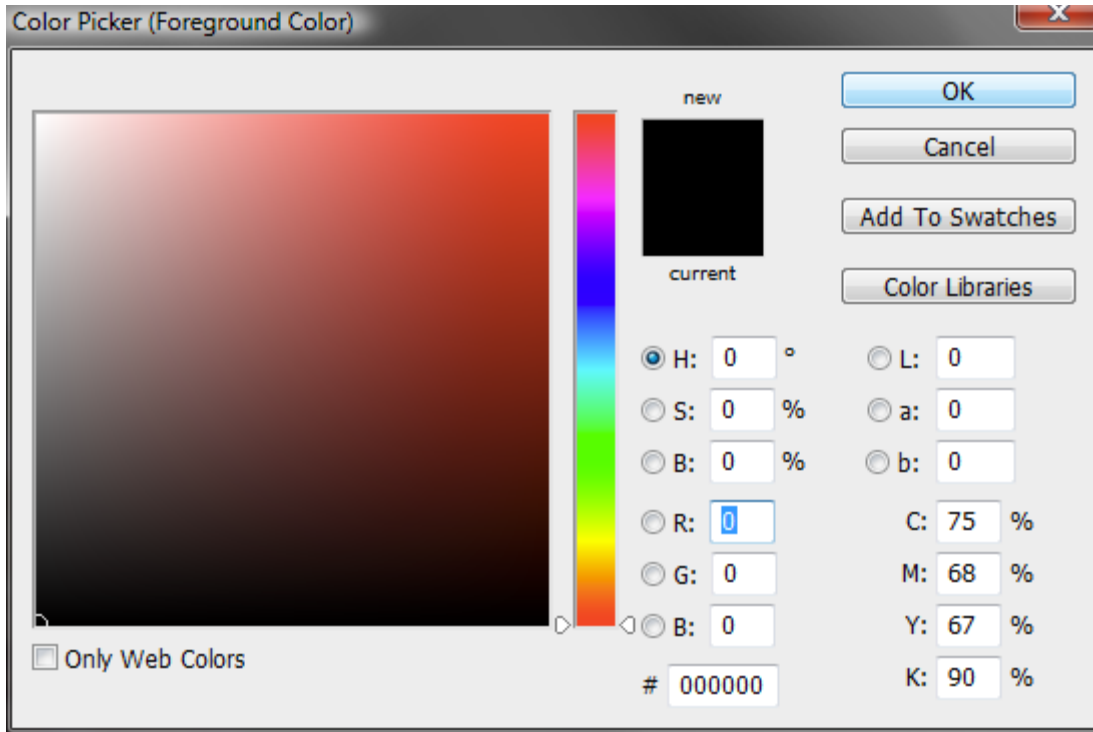
Click anywhere in the large window to select a shade or colour, you can select different colours by moving the triangles next to the vertical rainbow bar up and down. To select white simply select the region in the top left and click OK. Click on your photo and begin to type your name. The font choice, size and styles are available in the top menu of Photoshop. When you are done select the move tool and drag your text where you want it to be on your picture. To add a copyright symbol © hold the **Alt key and type 0169** on the PC to see a © and you should see it with most fonts (some fancy fonts do not support this symbol if so change the font to Arial or Verdana). To get a copyright symbol on the Mac - hold down the **Option + G** key. In Photoshop CC 2015 – you can also select a copyright symbol from the new Glyps panel Select Window > Glyps and find a copyright symbol while you are using the Text tool.

11. Sharpening your image - select **Filter > Sharpen > Unsharp Mask** and adjust the radius to 0.5 and Amount to about 150%. If you get a message this type must be rasterized - this means you need to go into layers and select the bottom image layer to sharpen – you should not have the text layer selected in the Layers palette. You can save the image at this point or if you like you can add a small border.

12. To add a border around your image go to **Select > All Edit > stroke**. You should see a pop up box - set the border width in pixels and colour you want and click OK. If you don't like the effect select **Edit > Undo or Ctrl-Z.**
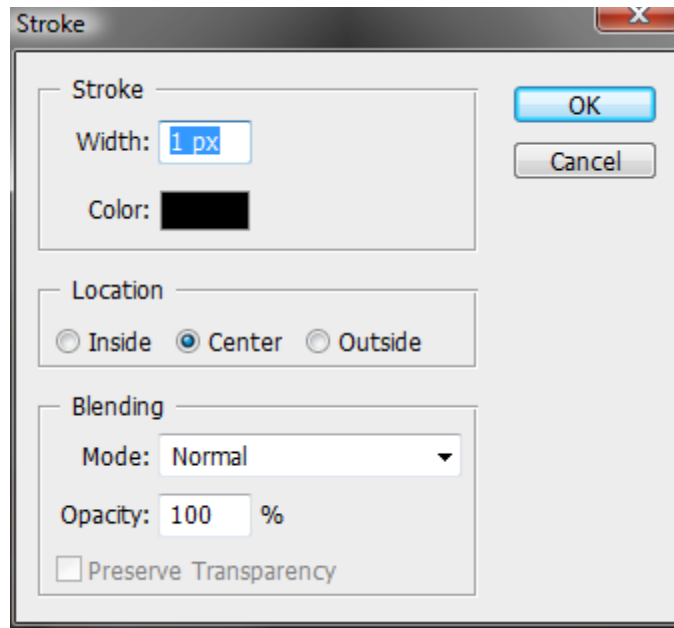
Above Stroke pop up box select color, size of stroke in pixels, Inside or center will work fine.

13. Final step is to save your file. If you plan to use the file for making prints then select > File > Save As and select TIF file format. If you need to send this image over the web or by email select Save as .jpg. If the file is destined for a web site, you need to select Image > size and drop the resolution to 72 dpi and then select **File > Save for Web & Devices (or File > Export > Save for web legacy in Photoshop CC2015)** and select the JPG format and the appropriate quality settings to get the file size you need.

 See jpgworkflow.mov

Summary basic workflow for working with JPG or TIF images:

1) Open your file.
2) If necessary trim or rotate the image.
3) Check the size and set the appropriate resolution 300 dpi for prints, 72 dpi for web.
4) Adjust the overall tones using the histogram.
5) Colour correct the image.
6) Burn, Dodge, or adjust local colour saturation with the sponge tool.
7) Adjust the overall colour saturation if required.
8) Repair or remove dust and scratches.
7) Add text or your name if you like.
9) Sharpen the print.
10) Add a border if you like.
11) Save the file TIF for printing or archival purposes - you can always open the TIF file and convert it into a JPG file at a later time.

With practice all these steps can be completed in only a few minutes and will form the bulk of your workflow. Also you don't have to fix all the images you have taken just select the best ones. My advice is only show folks your best photos, if you have lots show them only one or two the images will have more impact. I only keep bad images for teaching purposes.

Colour correction by the numbers

Some times autocolour is unable to remove a colour cast. When this occurs we can use the eyedropper tool, identify a region in the print that should be neutral in color (i.e. gray, white or black) and adjust the colours so the RGB numbers are equal or very close. You can use this technique anytime on any image if you want complete control of the colour in your image. This technique also works even if your monitor is not calibrated as you working by the colour numbers in the image they are not dependant on how they appear on your monitor.

1. Open the file called bluepolarizer_uncorrected.TIF in the folder **colourbycurves.** Select the eye dropper in Photoshop, open the info palette and move the eye dropper over the background trees and snow to determine the colour cast by reading the RGB values. Remember white snow or gray areas should have Red Green Blue values that are about equal.

Left is the uncorrected image and on the right is the colour corrected image
.

2. Placing the eyedropper over the snow covered trees in the top left of the image should reveal a strong red bias in the image on the left. E.g. R 166 G149 B128. To reduce the amount of red first start with the autocolour command and then check your eye dropper again. You should read something like: R157 G149 B120 - in other words Autocolour did not completely correct the image. Here is how to fix the excess red and yellow colour (reduced blue).

3. **Select Image > Adjustments > Curves** – then place the eyedropper tool over the trees in the top left of the image. On the curves window select Red at the top drop down menu. Then hold the Ctrl key and click the mouse with the eyedropper tool positioned over the background trees and you will see a black spot on the curves window (see below). This represents the tone in the image with the red cast that we will manipulate.
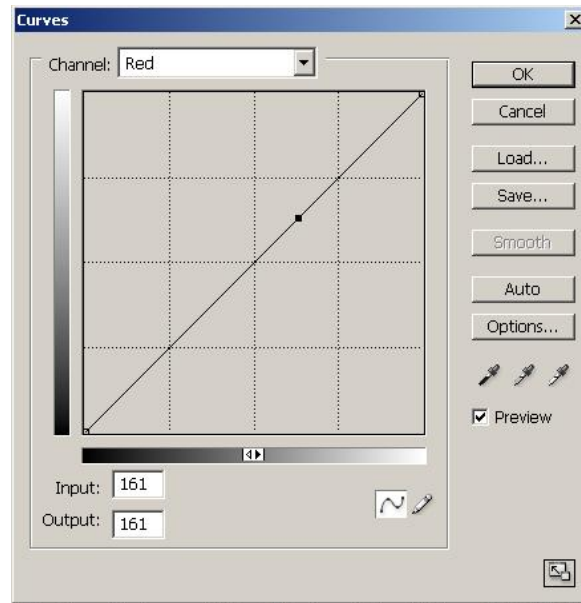
To reduce the amount of red you can either drag the dot on the curve down with the mouse or type in a lower number in the output box e.g. 150 – this will reduce the red in the image by the amount you type in. Using this technique you can selectively reduce or increase a specific colour in any area of an image. Once you balance the Red so it is about equal to the green colour, we will repeat this step but choose to fix the Blue colour which is low. Select the Blue channel from the top of the curves box, Ctrl-click the eye dropper on the background trees and then pull the blue curve up until the Blue, Green and Red colours are approximately equal. Essentially we are balancing the gray area (trees and snow) to be equal and all other colours in the picture will be adjusted accordingly. Sounds complicated but it's not - once you learn how to correct colour by the number even if your monitor is not calibrated you can be confident your image is "colour corrected". The main point is to select a gray area - if a gray colour is not available select a white or black - pure white is RGB 255, 255. 255 and pure black is 0,0,0 and middle gray is 128, 128, 128 - whatever shade of gray you use the RGB values should always be equal. In portraiture or commercial photography photographers sometimes include a gray card in one of the photos for this type of reference. In nature photography look for gray tree branches, gray road, rock, gray hair in your picture to select to neutralize (make numbers of R = G = B). Finally keep in mind that sometimes you don't want to remove the colour cast from all pictures for example for photos taken at sunrise or sunset! I use this procedure primarily for commercial photography.

 See colourbynumber.mov

Quick & Easy Photoshop Fixes

1) Removing "Red Eye"
2) Perspective Crop - straightening cooked images within a picture
3) Fixing crooked horizons
4) Fix keystone distortion

Fix Red Eye

Red eye is common in pictures taken with small compact cameras in low light. The red eye is caused by the reflection of blood vessels from the back of the eye. This occurs usually when photographing with a flash positioned close to the lens axis as is the case with most compact

cameras. To reduce the occurrence of "Red Eye" you can use the on camera red eye reduction which sends out a brief pulse of light before the main exposure, you can also use a flash positioned further away from the lens axis usually higher on top of the camera or off to one side of the camera. If you do get Red Eye it's a cinch to fix.

1. Open one of the photos with Red Eye in the folder called RedEye.

2. Select main tool panel and select the Red Eye repair tool - see below.
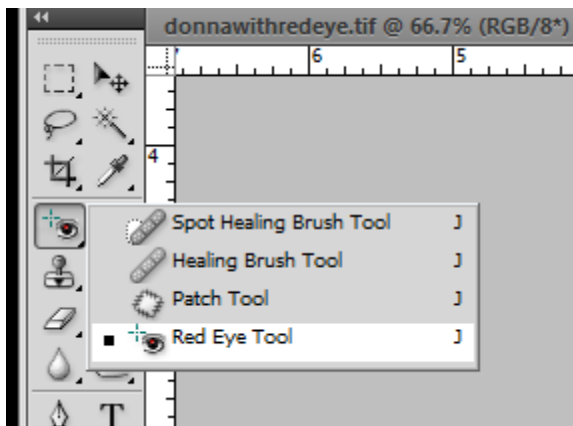
3. Click and drag a selection just over the red eye component on the photo - the red colour will immediately turn black. If there is still some red left over just repeat. The tool selects anything that is red within the selection and applies a black circular brush with transparency.

   See redeye.mov

Perspective Crop

If you ever photographed a painting or photograph in a glass frame on an angle to avoid light reflections off the glass you noticed that your photo will be distorted. Fixing this type of distortion in Photoshop is easy.

1. Select the photo in the folder image_repair called perspectivecrop.tif.
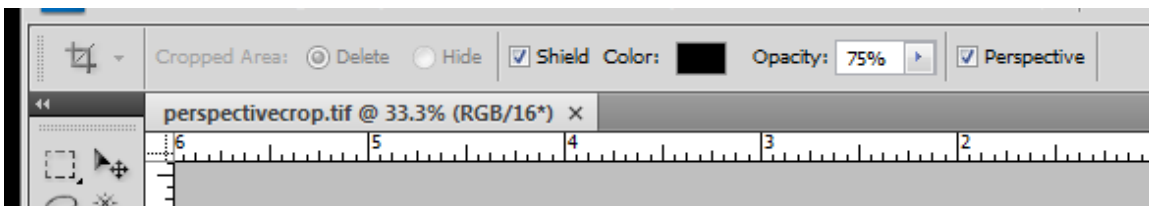

Photo showing perspective distortion

2. Select the crop tool in the main toolbar and drag it around the entire image.
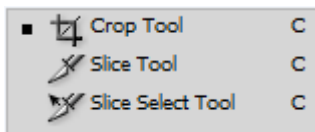
3. At the top of Photoshop in the application bar you will see a small check box with the word perspective beside it - make sure you have selected it i.e. there is a checkmark inside the box.

4. With your mouse pointer drag the corner handles on the selection to the corners of the picture frame.

Above shows the left corner "square" moved to the upper left corner of the photo. Drag all 4 corners and when you are done - press the Enter key and the image will be completely straight.


 See perspectivecrop.mov

Fixing Crooked Horizons

Crooked horizons are caused when the camera is not held level with the landscape and its easy to see this when photographing water or prairie scenes. Crooked horizons can be fixed in Adobe Camera Raw or within Photoshop's main window - we will fix a crooked horizon inside Photoshop – the tools are similar both use a ruler tool. There are small differences in different versions of Photoshop but they all use the ruler – **some versions of Photoshop (CS5) will straighten and automatically crop the photo by clicking on straighten button at the top**, but the most recent cloud versions of Photoshop require the user to crop the image manually.

1. Select the folder image repair and open the image called crooked_horizon.jpg - a picture of a lake scene where the water appears to be running down to the left of the picture.

Horizon Crocked

2. Select the ruler tool from the main toolbar as shown below (ruler may be elsewhere in Photoshop CC 2015.1 because the tools bar can be customized).
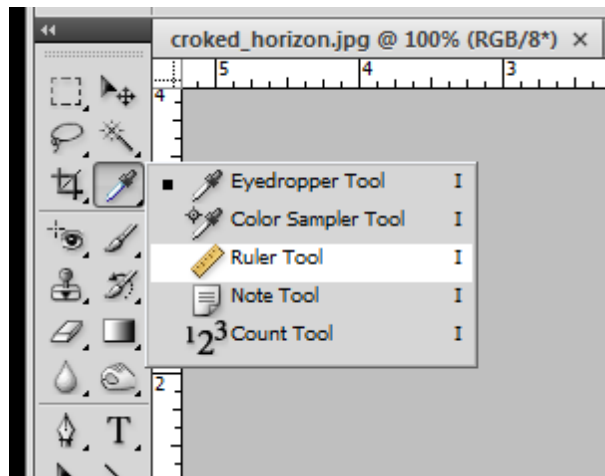

3. Click on the left side of the picture where the water meets the sky - hold your mouse down and drag a line to the right side of the picture to the point where the water meets the trees on the far side of the picture. You should see a line parallel with the water. If you make a mistake you can move the end points by clicking on them and dragging them with your mouse pointer. To turn of the ruler line select another tool e.g. Move tool.

Horizon Crocked

Drag the ruler to create a line that is parallel to the water – then at the top select **Straighten layer button in Photoshop CC2015** – you will need to crop the image to remove the white areas around the edges as described below. Note the instructions below for rotating the image are not needed in recent versions of Photoshop, but they will still work as described below.

4. In Photoshop CS4 from the menus select **Image > Image rotation > arbitrary** - you will see a pop up box called Rotate Canvas with an angle indicated - click OK and you will see the image rotated so that the horizon is now level. In newer versions of Photoshop there is a button at the top of **the window > Straighten layer** (it varies with different versions of Photoshop) click this tool and it will straighten the horizon. You will have to crop out the white portions of the image.
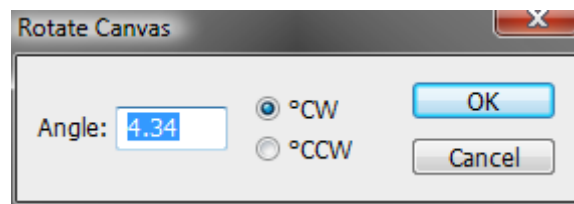
5. Final step is cropping the image to get rid of the white space created around the image. To facilitate cropping, make sure rulers are visible in Photoshop - if not select View > rulers. You click on ruler and hold your mouse down to drag out a blue guideline over the top, bottom and sides of the picture like that shown below.

6. The blue guide lines are dragged from the rulers and positioned on the corners. Then select the marquee tool at the top of the main tools panel. Drag the marquee inside the blue selection - it should snap to the guides so it selects the inside picture as shown below.

7. Select from the top menu **Image > Crop** then **Select > Deselect** to turn off the marquee tool and you are done and ready to save the image.

See crookedhorizon.mov

Keystone Correction

Keystone distortion often appears when you are close to a subject like a building and can't back away so you tilt your camera to capture the entire building. This type of distortion can be easily fixed in Photoshop.

1. Select the folder image repair and open the image keystone2.jpg. Zoom out of the photo so you have some empty space around the outside of the image.

2. From the menu choose **Select > All** - this puts a marquee selection around the entire image.

3. Then choose **View > Show Grid** - the grid is just an aid you can use to align the building with (if you prefer not to use a grid skip this step) .

4. **Edit > Free transform** or use the short cut **Ctrl-T** - you should see a small square selection at each corner of the picture.

5. To straighten the building - hold down the Ctrl key and drag a corner handle with the mouse pointer. Start by selecting the top left and then top right corner. When your done - hit the **ENTER** key to see the result. Remember to turn off the grid when you are done.
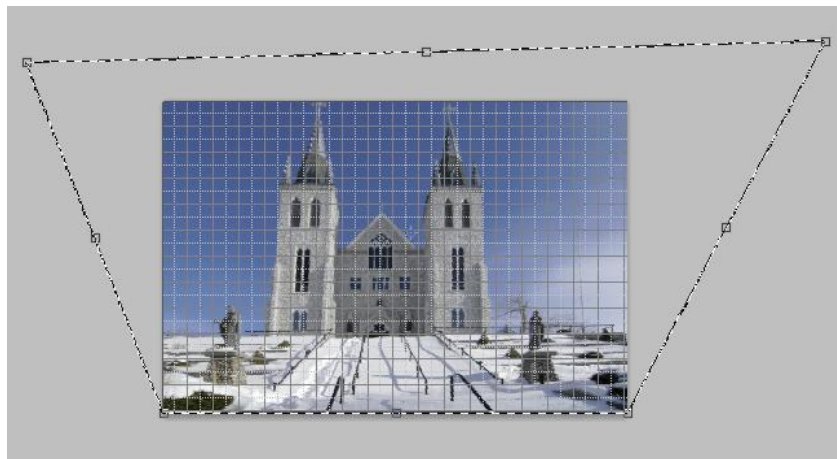
Drag the handles by Ctrl clicking on the corner handle and drag up and out - you may need to zoom out of the image so you have room to manipulate the corner handles.

See keystonecorrection.mov

Convert images to Black and White or Sepia

There are several ways to convert images to Black & white in Photoshop, the simplest is to open the image and select > Image > mode > grayscale however this method does not provide any control over the tones and is similar to taking a black and white photo with your digital camera. Instead if you select **Image > Adjustments > Black and white** - you can now control which colours will be light or dark in tone. Before digital photography black and white photographers used coloured filters to control tones in a picture. For example a red filter would darken its complimentary color like a blue sky, but would lighten anything that is red in the picture. With Photoshop you can control the tones of any colour in your picture by simulating adding a red filter or any colour filter during the conversion. **It is best if you shoot pictures in your camera in colour and then convert to black in white in Photoshop.**

1. Open the file kayak_color in the folder BW_color. To convert the image to black and white select **Image > adjustments > Black & White** – view the pop up box below, adjust the sliders to vary the tones for different colours You can also select presets from the drop down menu – to get specific effects built into Photoshop.
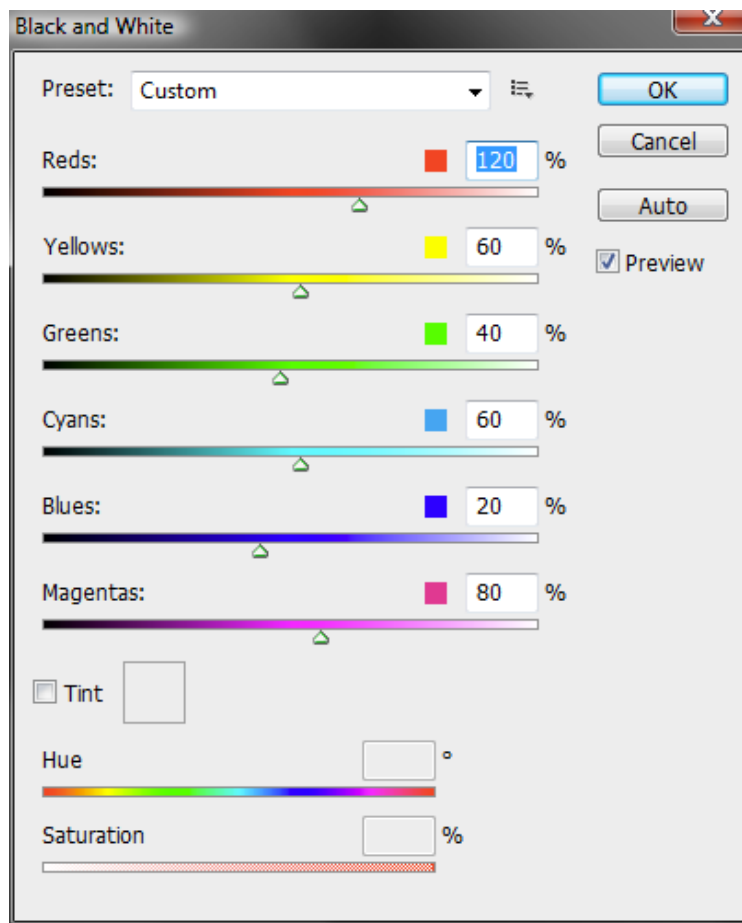
Drag the red slider while watching the tones in the photo. When you slide red to the right it will make reds lighter in tone, slide to the left and it will make the reds darker in tone. By sliding the different coloured filters you can control the tones of almost any colour in your BW photo. There

are no wrong or right settings it depends on what you want your image to look like. At the bottom is also a Tint checkbox you can use to create a monotone tint. You can select different tint colours and vary the saturation with the bottom sliders. Experiment and make a brown or sepia toned image.

See converttoBW.mov

## Create a Black and white image and return some of the original color

To create a BW image and return some of the original colour - you will need to use your history palette and the history paint brush.

1. Open the kayak colour picture kayak_color.tif. Make sure your history palette is also open select Window > history if it is not visible. The history palette acts like a tape recorder - every time you make a change to your picture it creates a new step and allows you to back up and undo several steps. By default it records 22 steps. You can freeze any particular point in your editing process by selecting the camera button at the bottom and making a picture of the specific point in the edit process. Once you close or save your file, however you no longer can access the history steps. We will use this tool to return color to part of the image after converting it to Black and White.

2. Convert the photo to black and white **Image > Adjustments > Black and White > OK**

3. Select the history brush tool from the main tool bar
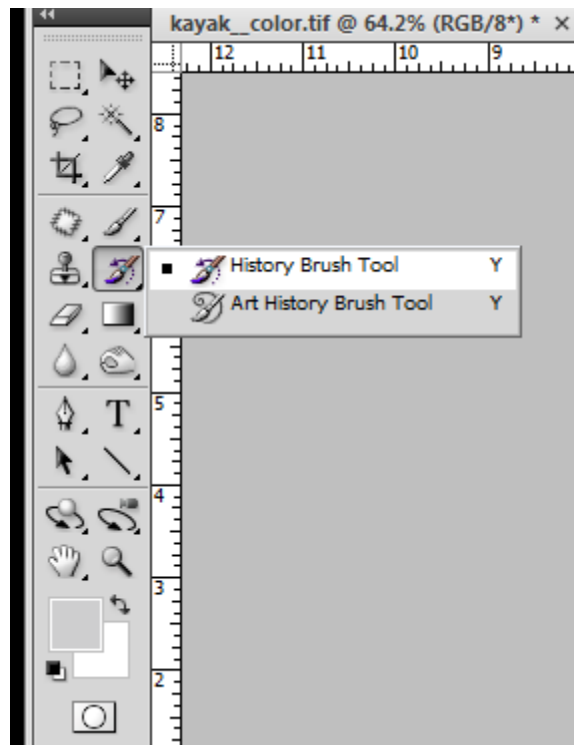
4. Select the history palette and click on the left side of the picture thumbnail or the step that says open at the top of the history palette - this sets the source of the history brush to the point

where you opened the image and when it was in colour. Painting with the brush will return the original colours in the picture from this earlier history state.
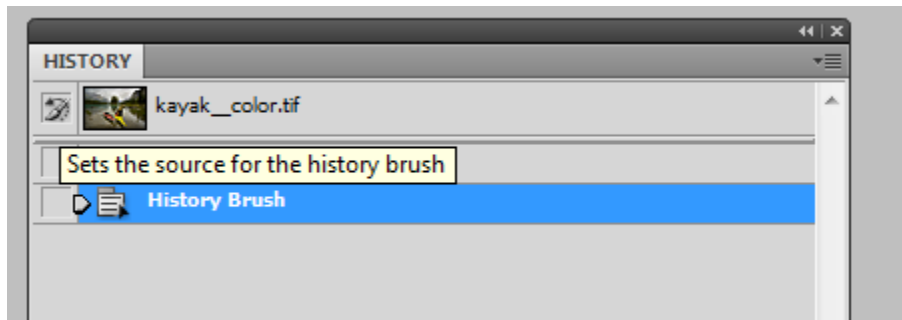
5. Adjust the diameter of the brush at the top as required and zoom in if necessary on the picture.

Start painting and you will see where ever you paint it will return the original colour. If you make a mistake hit Ctrl-Z or use the history palette to back up. You can also vary the opacity of the paint brush at the top of the options panel - set it to 50% or less if you want more control or want to make the colour "thinner". You can apply this technique to any of your photos.

Colour   Black & White   Brown Tone   Black & white & Colour

CP Train on Morrants' Curve in Banff National Park - using the BW colour technique.

Exercise: Select one of your own photos and try this technique.

 See BWcolour.mov

Repairing images using the clone tool

original image   After removing the pole   Cloning a few extras

The cloning tool has the ability to add or remove elements from any picture - it is even possible to clone elements from one picture into another. Some might say it's cheating but it can make a photo saleable. In this exercise you will learn how to remove the telephone pole from the original image, then increase the size of the picture to add more blue sky and finally you will learn how to take the lower left wing tip and copy it over to the top wing which was cut off and make it blend in. Even if you only master the clone tool you will quickly discover how useful it can be when it comes to repairing images.

1. Go the folder called cloning and open the file called snowywithpole.tif - you will see a snowy owl that has just taken off the top of a telephone pole. First thing we will do is crop the image. Make sure the rulers are visible if not select > View rulers. Right click on the ruler to set the units to inches.

2. Select the rectangular marquee tool located at the top left the main tools panel and drag it over the photo so the width is set to 11 inches and the height is set to 8 inches from the top left corner – we want to crop out the bottom corner and the left side of the photo.

3. Select **Image > Crop**. You should now only be viewing the part of the image that was within the marquee selection you made.

4. We are going to increase the size of the image canvas so we can add more sky. To do this select **Image > Canvas size** and you will see a pop up box and you should see the dimension of Width 11 and Height 8 inches or thereabouts.
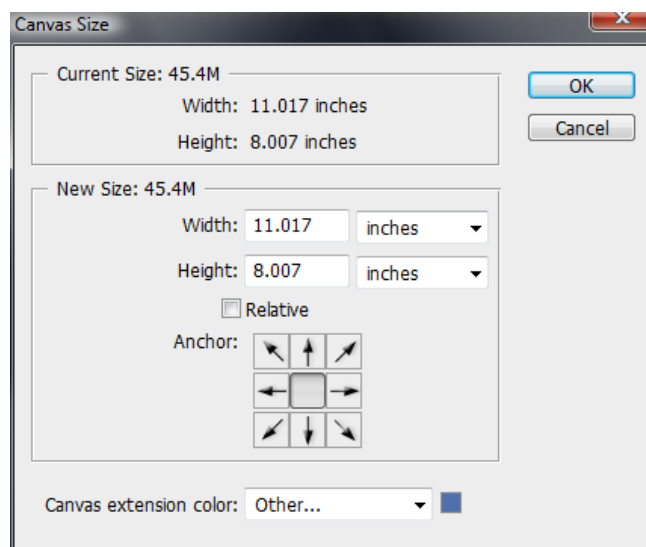
5. Set the Height to 10 inches and width to 14 inches. Also select the lower right corner in the Anchor boxes - this will make the new canvas area appear to the top and left of your current image. Finally click on the square beside Canvas extension color and then click on the blue sky in the photo to select the blue color in the sky. This will make the additional canvas area the same blue colour - though you will see the sky won't be a perfect match – but we will fix this.
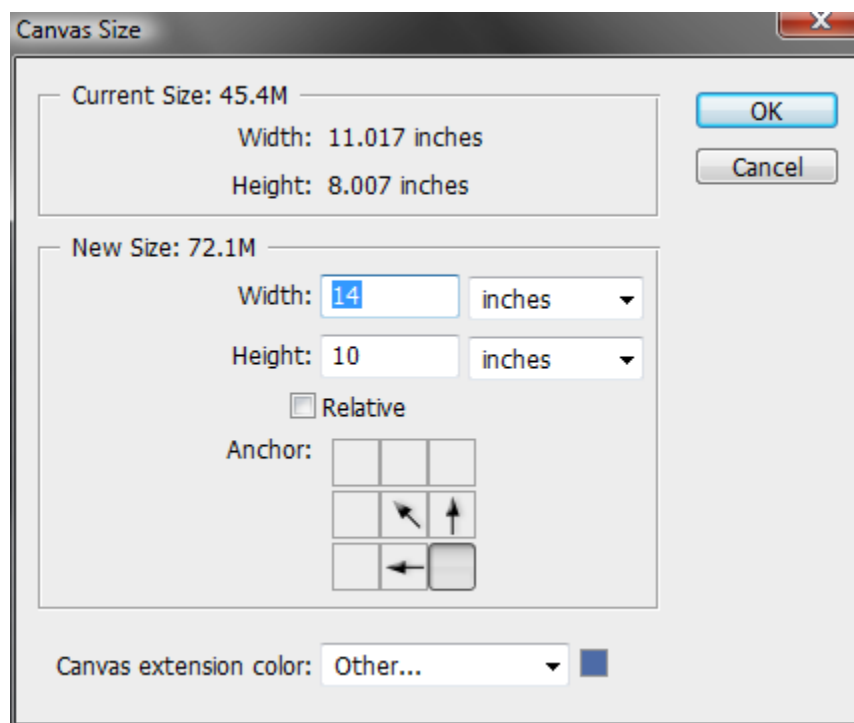
6. To make the blue sky even and all one shade of blue Select the magic wand from the tools panel (2nd from top usually). In the application bar at the very top of Photoshop you will see a text box called Tolerance. Set this number to 12 - the default is 32. The tolerance refers to how similar colours are to be selected. Higher numbers mean you will select more colour shades and we only want shades of blue. With the magic wand selected - click on the sky in the top left of the picture.

You will see the marquee extend around the owl and telephone pole selecting most of the picture except for the small blue area on the lower right. To include the blue area in the lower right in the selection - take the magic wand and **shift click** on the blue sky area in the lower right part of the picture to include it. Shift-clicking adds to the original selection (i.e. Hold down the shift key while you click on the area with your magic wand).

7. Before we fill in the sky selection with a uniform blue - Select the eyedropper tool and then click on the sky in the picture to select a blue colour from the mage.
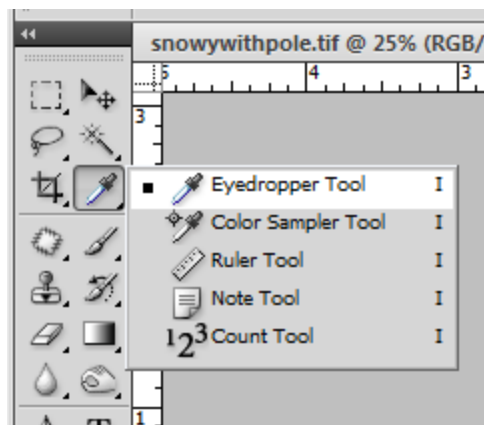
Eyedropper tool

8. Select **Edit > fill** in the pop up box select foreground colour - the colour you selected with the eyedropper. And finally to remove the marquee selection go to the top menu of Photoshop choose **Select > Deselect (or Ctrl-D).** The Sky should now be a uniform blue color.

9. Our next task is to remove the telephone pole and wires using the cloning tool. The clone tool takes an adjacent area and moves it over top of what you select to paint over. Select the clone stamp tool.
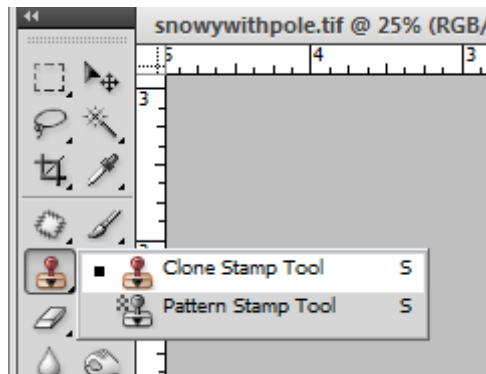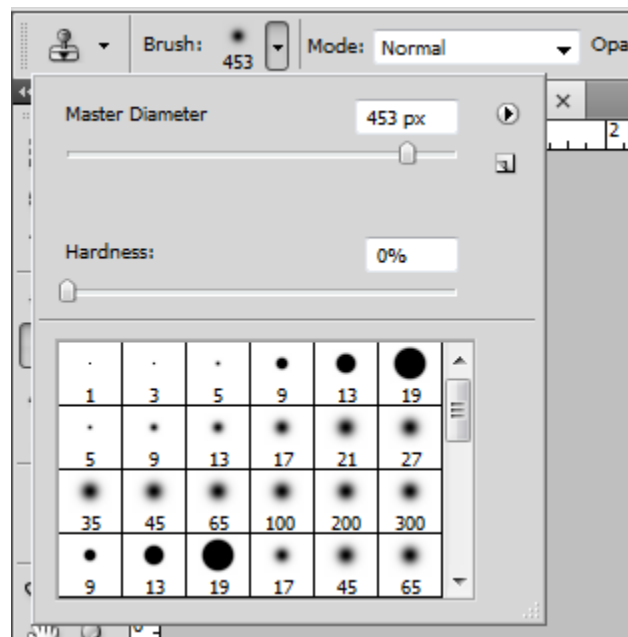

CS4
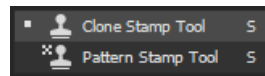
CC2016

10. Move the tool over the picture and you will see a circle. The diameter of the circle determines how big an area you will select and move - the diameter of the clone area is controlled at the top of Photoshop by selecting the Brush tool (you can also use the square brackets as described earlier).

The brush tool determines the diameter and edge hardness. For cloning I recommend setting the hardness to 0% which means a soft feathered edge. The diameter will vary with the parts of the picture you plan to clone over. A good diameter to start with is 150px for moving sky over the telephone wire.

11. Let's start by getting rid of the telephone wire on the left side of the owl. Place your clone tool above the wire but not touching it. Hold down the Alt Key - your cursor will turn into a smaller target symbol - keep holding down the Alt key (left hand) and with your right hand click down on the mouse button and drag the target over the wire. Then let go of the Alt key (first) then release the mouse button. Now press down on the mouse button and you will see a + symbol where you start to drag the mouse pointer. The cross indicates or shows you what area of the

picture you are cloning and where you click your mouse down on is where the cloned sky will appear - over the telephone wire. You can change the source part of the picture that you are cloning anytime by repeating these steps and you can adjust the brush size anytime. With a little bit of practice you can clone and remove almost anything on your picture. Repeat and clone blue sky over the telephone pole until it's completely gone - leave the wing for last.

To get rid of the wire on the wing, zoom into the picture and reduce the diameter of the clone tool to about 90 pixels. Then zoom into the wing area and carefully clone out the telephone wire.

With the wire gone and you should have an isolated bird in your sky The trick with cloning is to click multiple times during the process- in other words try not to paint long strokes but instead use multiple short strokes or dabs - this results in better blending. Cloning takes a little bit of practice but once mastered you will love what you can do with it.

Finally let's fix the cut off wing. To this we need to select the wing tip from the lower left and transfer to the top right, flip it over and then blend the wing tip into the main wing.

12. Select the marquee tool and draw a rectangle around the lower left wing tip.
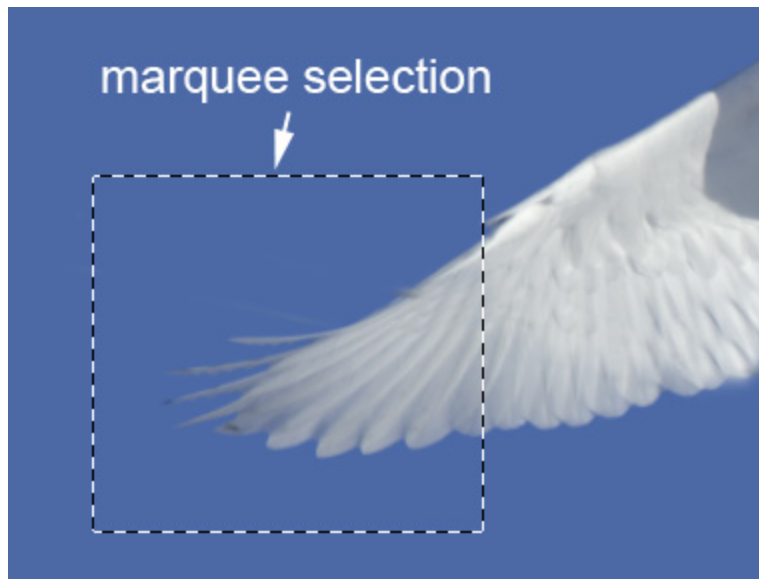
13. Choose **Edit > Copy** - **then Edit > Paste** - this will copy the selected area and paste the image back on top of the original. To see the pasted selection - select the move tool (cross with arrows at the top of the main tool bar).
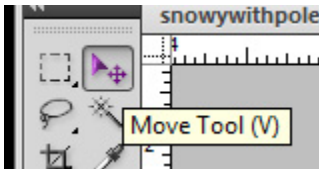
Click and drag over the wing tip and you should see the copied graphic move. Move the graphic to the top right wing.

14. To get the wing tip to fit over top of the right wing we need to flip it over and rotate it. To do this Select **Edit > Free Transform (or hit the shortcut Ctrl-T).** When you do this you will see a selection around the wing tip. To flip the wing tip click on the right handle and drag it to the left until the image appears to flip over.
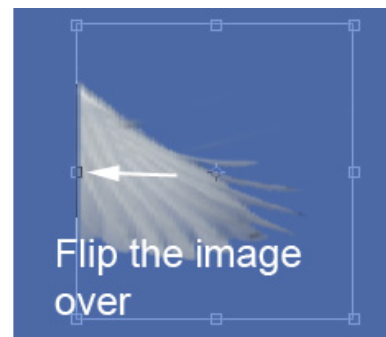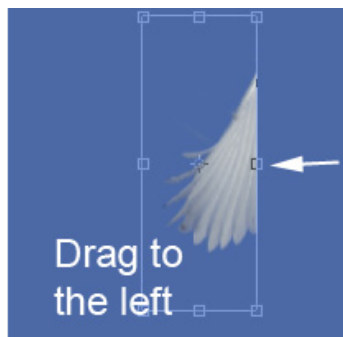
15. Once you have the wing tip flipped - move it to the right top wing edge by clicking and dragging the selection. We need to rotate it and move it over top of the right wing. To rotate the image - you should still have the image and handles visible. Place your cursor outside one of the corners - a few millimeters away and you should see a curved arrow appear. Click and drag with your mouse pointer and you will see the selected area rotate. Line up the wing tip as shown below and then click Enter and the handles will disappear. You can move your selection one pixel at a time by using the arrow keys on your keyboard.


To make the wing tip blend into the existing wing we need to create a blending mask. Blending masks are covered in more detail in my Photoshop II workshop – masks are very powerful and allow you to blend any image into another such as montages and panoramas.

16. Select the layers palette and click on the layer mask button at the bottom as shown below.
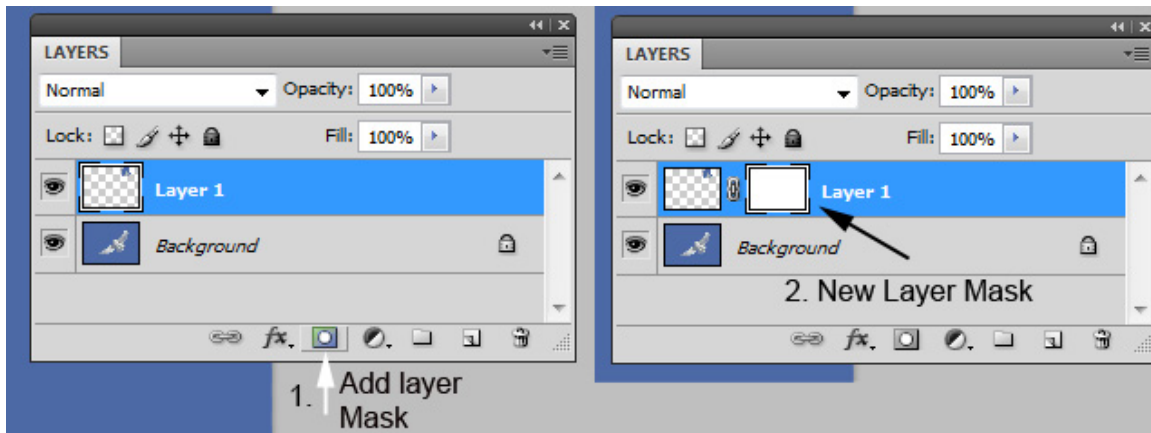
17. Set your foreground colour to black and background colour to white - this are the default colour settings on the toolbar. Select the paint brush tool set the diameter of the brush to about 56 pixels in diameter - hardness set to 0% - so it has a soft edge. Make sure that the top layer mask is selected in the layers palette.
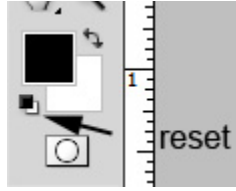
18. With your brush paint around the bottom edge of the wing tip using black. Where ever you paint black it makes the mask layer transparent and so the picture below shows through. If you paint too much you will see the sky show through - no problem - select white and paint again to return the mask. Black makes the mask transparent and painting white makes the mask opaque. The trick is to paint the edges so it the wing tip above blends nicely with the wing below it. This requires a little bit of artistry to make a smooth blend so that no wing seem is visible.

If the brushes are not working for you make sure that when you positioned the wing tip over the bottom wing that you had some overlap with the bottom wing. Without overlap when you paint black you will simply see blue sky below the wing. If this happens move the wing further down along the main wing. When you are done - flattened the layers in the layers palette - top right button on the layers palette it compresses all the layers into one.
..

19. Select the layers palette - at the top right select the pop out menu and select flatten to flatten the layers - to clone you need all the components on one layer. Select the clone tool and set the brush diameter to about 370 pixels. Place your cursor over the owls head, **hold down the Alt key and then click and drag your mouse** above and the left of the owl. Let go of the Alt key, lift your finger off the mouse just for a second then press it back down - hold it down again and paint.

Two snowy Owls

The Clone tool can be used to add or remove any elements from your picture; telephone poles, dust spots, scratches and more. The trick is to clone is such a way that it's not obvious what you did. Pay attention to the direction and quality of light if cloning other elements into your picture.

 See clonerepairowl.mov

## Retouching a Portrait - using layers, patch tool and the liquify tool

Before   After

Retouching portraits is an art - the trick is to make your clients or friend look their very best but do it in a way that isn't obvious. Many of the cover girls you see on magazines have been touched up in Photoshop. When I photograph young people at their graduation I often touch up the portraits removing pimples, whitening teeth etc. so clients look their best. Removing wrinkles especially around the eyes and on the forehead can make a person look younger and without the need for botox injections or dieting. No one has ever complained when I make them look younger.

1. Open the image Rob_Berdan_square.tif.

2. Select **Image > duplicate** - by working on a duplicate image we can compare it to the original as we work, but this step is for comparison only and is not required.

3. Then open or select the layers palette. Right click on the bottom Background layer in the layers palette and choose duplicate. This will create a copy of the bottom layer. Select the top layer - called Background copy. We will touch up the top layer and then blend it with the bottom layer – by varying the opacity of the top layer we can make any edits appear more realistic and subtle.

4. From the main toolbar select the patch tool as shown below.
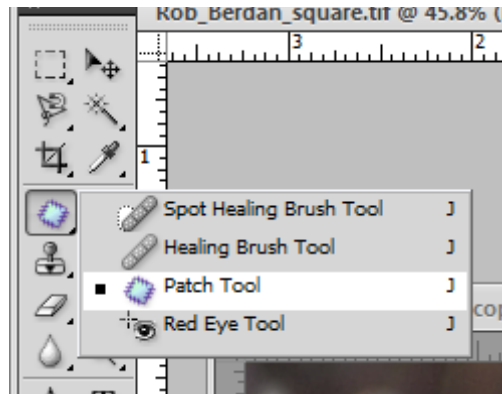
5. Drag around the wrinkles at the side of the eye as shown below - then drag this selection to the cheeks and let go. This will take the skin from the cheeks area and blend them into the area you selected around the eye.


6. Repeat for the right eye and then do the same for wrinkles on the forehead. When you are done - you can see that it looks just a little too smooth under the eyes. So we are going to bring back some of the wrinkles by varying the opacity of the top layer.
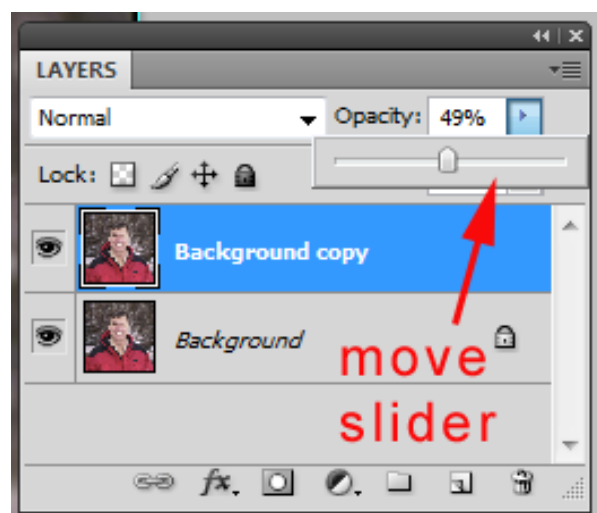
As you vary the opacity there will be a point where the wrinkles just begin to appear - that is usually the best setting. Then from the top left menu in the layers palette chose > Flatten image as we did before.(Top right of the layers palette – under the x – pop out menu select flatten).

7. Now let's take a few pounds off the face with the liquify command. Select **Filter > Liquify**. Select the Forward warp tool at the top left and leave the default settings for size, brush density and pressure. Position the circle next to the left cheek then click down and push into the face. This tool can also do wonders reducing "love handles" and can also be used to enlarge or enhance body parts, It can even make the top and sides of my head flat like Frankenstein - the liquify tool is definitely worth playing around with but keep in mind some people are sensitive if you over distort them. When you are done click OK and save your image.
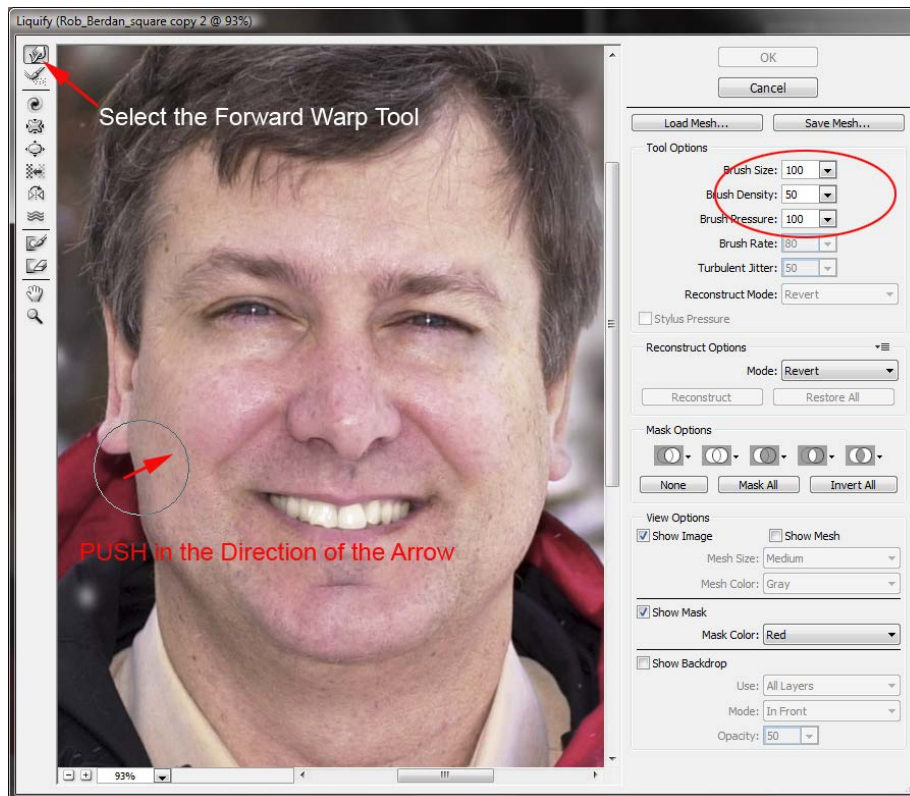
Liquify box - Select the Forward Warp Tool on the top left. Brush size of about 100 pixels should work well - position the circular selection to the left side of the face and then click and drag your mouse and watch the face deform. Repeat on the right side and around the sides of the neck. When you are done - Click Ok. You can experiment with the other tools on the left to learn how you can distort images in many other ways. Have fun, but remember some people can be sensitive playing with their face so I recommend starting with your own portrait before you start to play with photos of your friends :-).

 See portraitretouching.mov

Repairing old photos

Fixing up old photos can be challenging, fun and put some money in your pocket. Many of us have access to old family photos that are begging to be repaired. To fix these old images you can use a flat-bed scanner to digitize them or simply photograph them with your digital camera. If you want to make prints from the image the final resolution of your images should be 300 dpi. The reason that most flatbed scanners offer much higher resolutions is that if you have a very small image e.g. a wallet photo and you want to make an 8 x 10 in print - you will need to scan the image at 1200 dpi or higher - then resize it in Photoshop to 8 x 10 and drop the resolution to 300 dpi. So long as the resultant file size is not much bigger then what the scanned image was you should get good results. Generally I recommend scanning any photos at 2-4X higher than 300 dpi - because if you are going to spend time fixing the image you probably only want to do it once.

Before and after shots including a hand coloured version from one of my clients

You already have used all the tools that you need to repair damaged photos. The basic steps are:

1. Open the file - crop and rotate the image if necessary (there are several images in the old_images folder you can play with if you don't have your own images).

2. If the image has a strong brown cast or water stains, convert the image to black and white use the colour sliders to selectively remove yellow or brown stains.

3. If the image is low in contrast select **Image > Adjustment > levels** and optimize the tones - this usually will give you better contrast with old photos.

4. Use the clone and patch tools to repair large areas of the print - zoom in close if necessary.

5. If there are many tiny dust spots embedded in the image this could take forever - to reduce these small dirt specks select **Filter > Noise > Dust & Scratches** set the Threshold to 0 and the radius to 1-2 pixels. If you set the radius higher you will start to blur important features in your photo, but the dust and scratches filter can save you hours of fixing small dust spots.

6. You can add a tint to the photo using the Convert to Black and white feature you learned earlier. You can even colour BW prints - a feature I will cover in the Photoshop II workshop.

See repairoldimage.mov

Extracting images from their background - Photoshop CS3, CS4 & CS5

Note the extract filter has unfortunately been removed from CS6 onward and replaced with the quick selection tool (page 71 I show how to use the new fast selection tool to extract an image). I still prefer the extract tool for some, but it requires an older version of Photoshop. If you don't have an older version of Photoshop skip this section and move to the tutorial on page 71).

The Extract filter appears under the top menu **Filter > extract** and should be the third menu down - if you do not see this feature in the menu you can install the extract filter in CS4 and 5 only. In Photoshop CS4 Adobe has made this feature an optional plug-in that must be installed manually - see web for instructions on how to do this. The extract filter is a useful tool for isolating and removing subjects from their background and allows you to place the extracted image onto a new background. It is particularly useful for commercial work, but it can also be used to create interesting artistic photos.

1. In Photoshop select **File > open** and navigate to the folder called extraction. In the folder select and open the image called baldeagle.tif and eaglesintrees.tif. Both images are the same size and resolution.

2. Select the baldeagle.tif file then select **Filter > extract** and you will see a new window with various controls - Select the highlight marker tool at the top left - set the brush size to about 10 pixels on the right side of the window. The size of the brush can be varied for different types of edges. Trace around the eagle with half of the highlight on the background and the other half on the eagle. You are selecting edges. Where the feathers are jagged and rough, paint to cover the feathers. In regions where the edges are smooth you can shift click between points to join them i.e. click on one spot then move down the edge and shift click and it will join the two points with a line. Zooming in can also be helpful as tracing the image requires less dexterity when you do this. A good smooth moving mouse and mouse pad is essential. Do not leave any gaps in your outline!

PHOTOSHOP TIP – when using the extract tool you can draw strait lines by shift clicking between points it will create a straight line between the first and second point.

The Extract tool can only be used in Photoshop CS4-CS5 and the plugin must be manually installed in CS5 and has been replaced in CS6 with the quick selection tool – see tutorial on page 71.
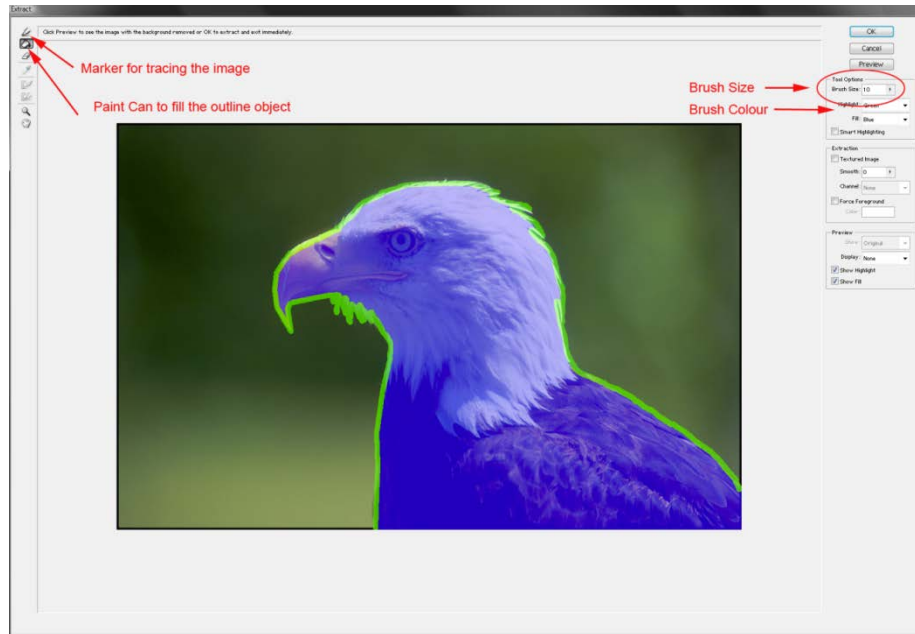
3. If you make a mistake you can use the eraser tool on the left to remove part of the line. When you are done, select the paint bucket and click inside the eagle - if you have not left any spaces it will fill with a translucent blue colour as shown above. If the blue colour spills into the picture you left a gap. Simply select the tracing tool again, zoom in if necessary and fill in any gaps you might have left and then try the paint bucket tool again. If it looks like the picture above - click preview to see the extracted picture - then OK to take you back into Photoshop.

4. Use the eraser tool from the main tools panel in Photoshop to remove any extra pixels around the edge of the eagle. The hatched background indicates the background is transparent.

5. Move the extracted eagle to the other picture > eaglesintrees.tif - to do this, select the move tool in the main tool panel. Have both the extracted eagle and the eagleintrees.tif files open and positioned side by side. Place the move tool over the extracted eagle - then click down on the eagle and drag it into the eaglesintrees.tif image and let go.

6. Use the move tool to position the eagle on the new background. You can also change the size of the eagle even flip it over - to do this select Edit>free transform or Ctrl-T. You will see handles around the eagle. Click on a corner handle and hold the shift key to keep size proportions and drag the picture smaller or larger. Drag the right handle to the left until the image flips over - when you are done hit you ENTER key. You can even drag over more than one instance of the eagle!

7. To create new background using a solid colour fill select the extracted eagle picture and then open the layers palette if it is not already open – Window >layers. At the bottom right of the layers palette click on the new layer icon to create a new layer- it will be called Layer 1 and appear above your existing layer. Click on the top layer and drag it down so it is below Layer 0 as shown below.
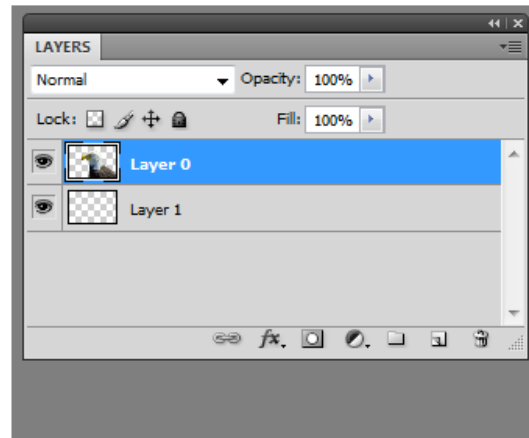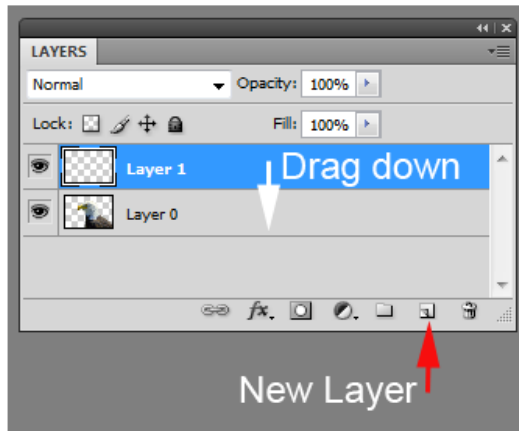
8. Select Layer 1 - the bottom layer in the layers palette by clicking on it with your mouse. Select a foreground colour in the main tools panel - then choose **Edit > Fill** - the pop up box should say use foreground colour > OK - you should see a solid colour behind the eagle.

You may wish to try some additional examples in the folder. Included in the folder is a picture of a model fish - you can see the before and after shots below. The completed fish has three backgrounds, transparent, white and black. The edges of the fish were blurred slightly so the edges did not appear rough after extraction. The extracted fish image was prepared for a multimedia program.

Before

After

 See extraction.mov

Simulate a neutral density gradient filter in Adobe Camera RAW

Without a grad filter   With a simulated graduated filter

Photographers often use a neutral density graduated filter to darken skies and lighten the foreground of pictures - especially photos taken at sunrise or sunset. If you don't own a grad filter or did not have one with you - it is possible to simulate adding a grad filter afterwards in Photoshop. There are two ways of doing this. 1) In Adobe Camera Raw and 2) in Photoshop using layers.

Adding a Neutral Density Graduated filter using Adobe Camera RAW

1. Open the grads folder and select the Raw file Chinook.NEF in ACR.

2. Then select the grad filter at the top of ACR window (see below), click and drag your mouse from the top of the picture to the bottom of the sky and adjust exposure in the right panel. When you are done - select Open Image.
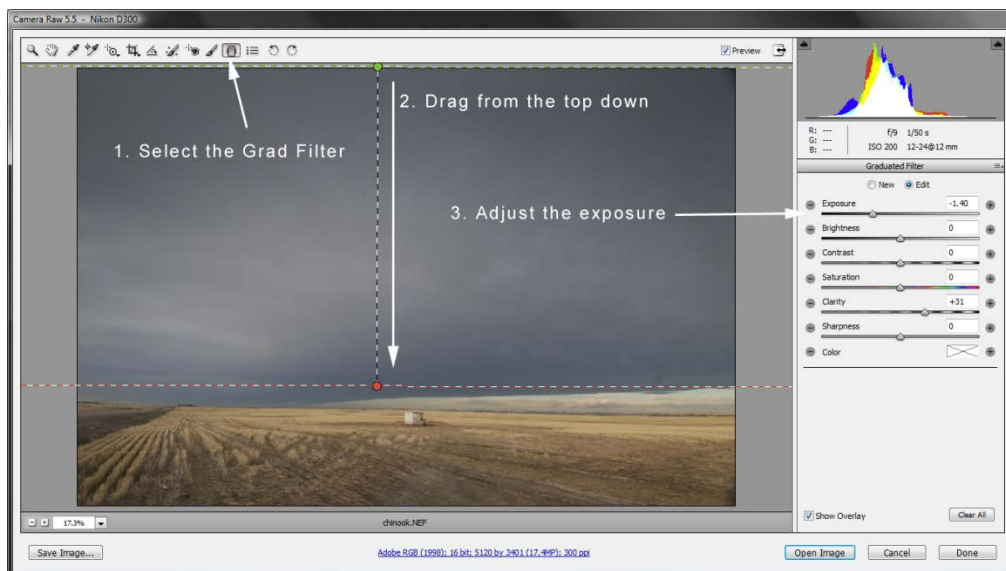

Chinook, NEF file in ACR. A neutral density grad filter can add drama and darken your skies

If you are not working with a RAW file, Select Filter Camera RAW and you can now apply a graduated filter to the sky of your JPG or TIF images in the same way.

Another method to add a Graduated neutral density filter with JPG or TIF file in older versions of Photoshop (CS3,4, 5 and 6) is to use the layers palette.

1. Select the grads folder again and open the image called wolf_nograd.tif. This image has a fairly dramatic sky but we will darken it even more.

2. On the main tool panel reset the foreground and background colors to Black (on top) and white on the Bottom.
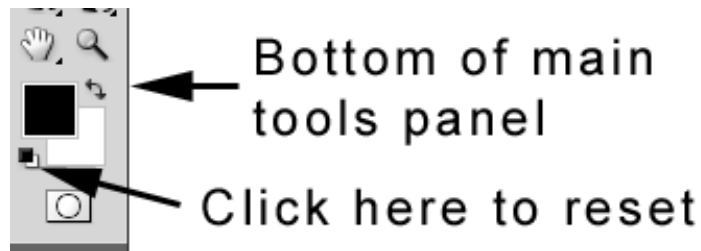
3. Open your layers palette if it's not already open select **Window > layers**. At the bottom of the layers palette, Alt - click on the fill adjustment layer icon (black and white half circle) and from the pop up menu **select > gradient**. (The reason you must select the Alt key when you click is so you will have the option to select a blending mode in the next pop up box).

4. From the New layer pop up box **Select > Mode > Overlay > OK**. The overlay blending mode simulates the effect of putting a grad filter in front of your picture. If you don't use overlay blending mode you will simply put a black to white gradient on top of your image - we want the gradient to blend into the picture not cover it up.
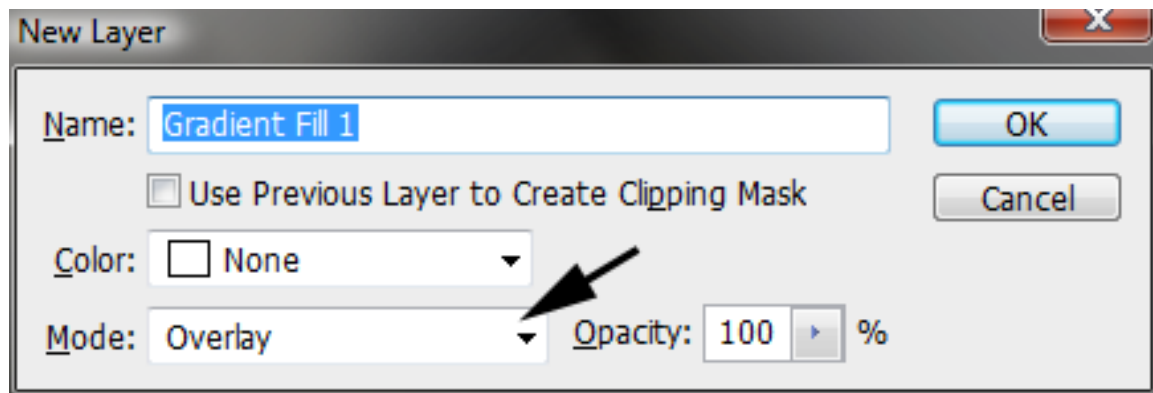

5. In the Gradient field pop up box that comes up put a checkmark in the reverse box and dither box. By default the gradient runs from the bottom up so we need to reverse it. With this box open, you can use the move tool to click and drag on your picture and move the gradient up or down just like putting a real filter in front of your camera lens. Also click on the right side of the Scale control to view a slider. Slide to the left to create a hard edge on the grad, slide to the right to soften the gradient edge. Photographers often purchase hard or soft edge grad filters, Photoshop lets you simulate either type of grad filter easily. It is also possible to add colour to the gradient and rotate the angle - these features will be covered in Photoshop II workshop. When you are done click OK.
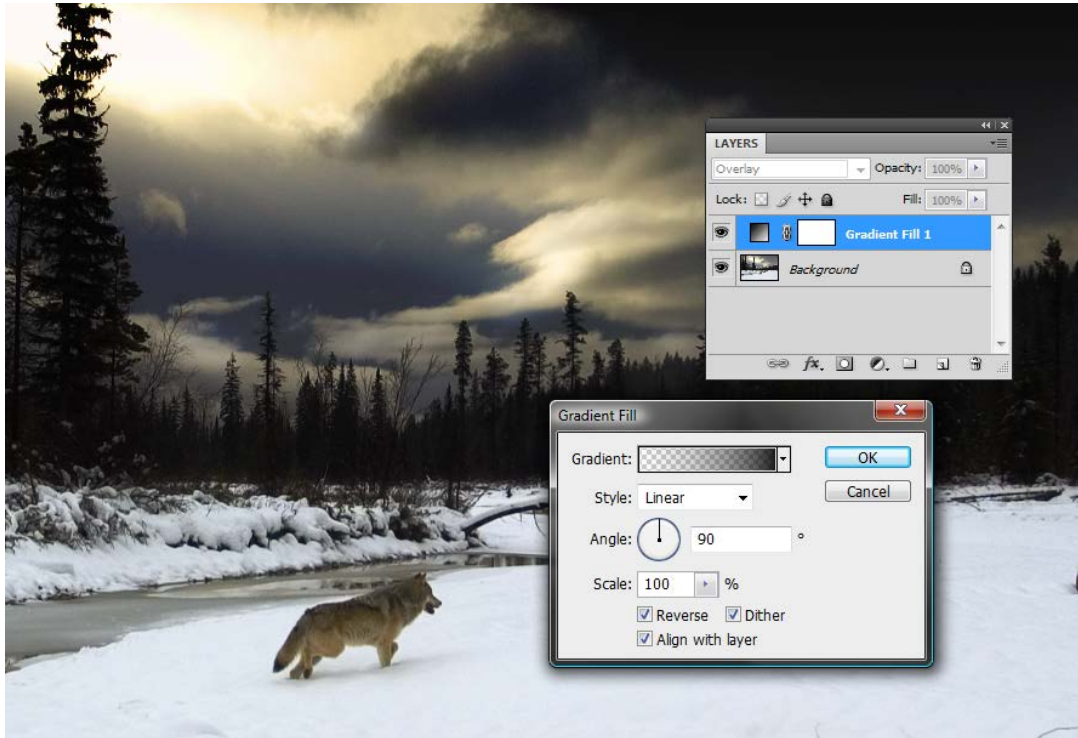
Adding a gradient overlay adds a layer above your picture. You can vary the strength of the filter by selecting opacity in the top right layer panel and sliding it left or right. Click on the eye ball next to the layer palette to turn the filter effect off to see the difference between before and after.

6. The final step is to flatten the image before you save it. To do this click on the top right of the layers palette to open the pop down menu and from the drop down menu select flatten. This will combine the gradient filter with the bottom layer. Save your file as whateverfilename.tif.
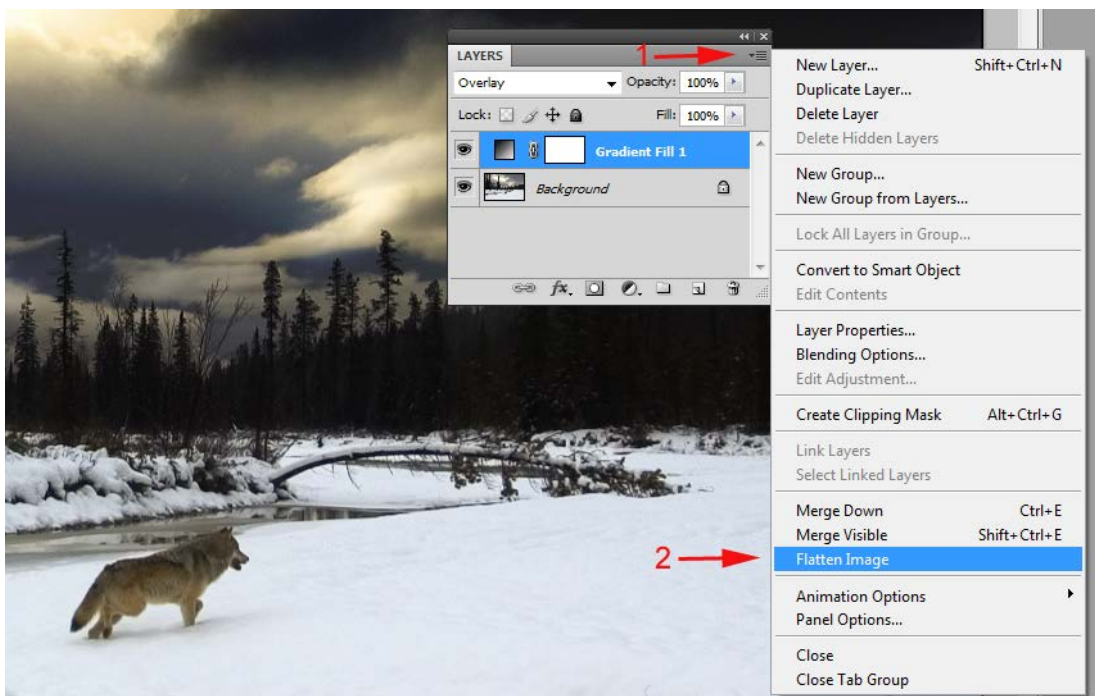
 See neutralgradfilter.mov

Shadow Highlight tool

The Shadow Highlight tool lightens areas in the shadows and can reveal hidden detail and it can also be used to bring down overly bright areas or highlight regions.

Before and after images using the shadow highlight tool

1. Select the folder called shadowhightlight and open the image called kayak01.tif.

2. Select **Image > adjustments > Shadow Highlight** - if the checkbox "Show More Options" is selected unselect this box so you only see two sliders - Shadows, and Highlights as shown below.
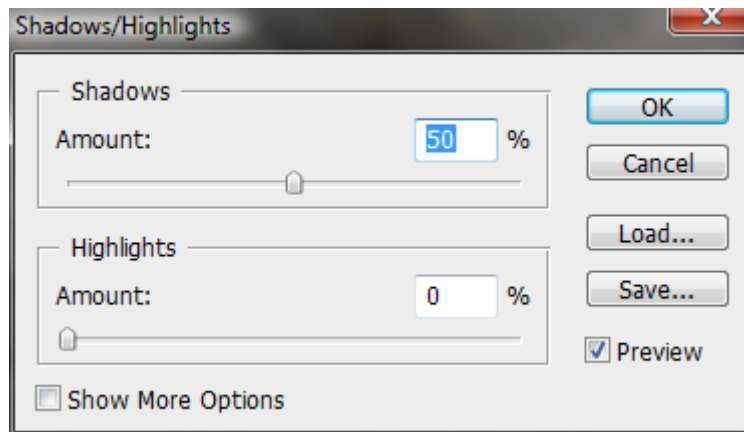
3. I recommend starting with both sliders set completely to the left.

4. Drag the shadow slider to the right to about 60% and note how details in the shadows become visible. Slide the highlight control to the right and note how very bright areas become darker (about 12% seems good). These controls can allow you to adjust the apparent dynamic range of your pictures. If you select Show More Options - you can vary the tonal

width that is affected by the sliders - see the movie Hidden_In_the_Shadows.mov provided by Adobe. I have also included a file shadowhighlightspattern.tif that you can experiment with to see how the controls affect different tones in your picture.

See shadowhighlight.mov

Blending photos to make a panorama

Stitching images together to make panoramas has never been easier - you don't even need a tripod when you take the pictures though it will help. The two most important things you need to do is 1) lock the exposure so the exposure does not change as you pan your camera taking several pictures. You can switch your camera to manual mode or if your camera has a pan mode use it to lock the exposure while taking the series. 2) You need to have overlap between each picture about 20-30% of the frame works well. If you don't have enough overlap Photoshop will not be able to stitch the images. There are special tripod heads you can purchase if you would like to make panoramas frequently. For best results have your camera in the vertical position so your panoramas will be taller as shown above. You can use two or more images - so technically you always have the ability to create wide angle shots no matter what lens you have with you.

1. Select **File > Automate > Photomerge** select Browse go to the folder called Kananaskis_pan and Shift-click on the images 01.jpg to 08.jpg. In the layout menu select cylindrical - this option is best most of the time. You can experiment with the other modes on the same photo series. Click OK and watch Photoshop stitch your image together.
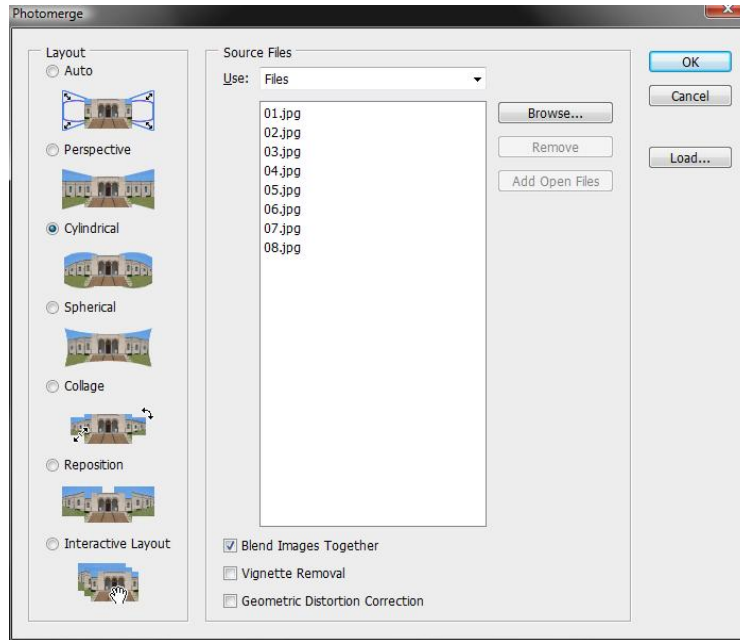
2. Open the layers palette you will see that each photo has been placed on its own layer and Photoshop created a mask to blend each photo. Select the top right of the layers palette to display the pop out menu and select flatten image to combine all the layers into one.

3. The final step is to crop the image using either the crop tool or the marquee selection tool or you can fill the top and bottom parts of the image using Fill > Edit > Content aware and it will put in extra sky or ground.

4. If the image needs further adjustments or modification make them - then save the image for printing or the web.

Repeat the steps again and try blending three JPG files that were hand held - road01.JPG, road02.JPG and road03.JPG. Experiment with the different merge modes if you like.

Another hint for taking panoramas is to try not to shoot directly into the sun - place the sun behind a tree or telephone pole. The best time of day to take panoramas is when the sun is overhead. Once in a while Photoshop is unsuccessful in stitching images together this usually occurs if there is not enough overlap between the pictures. The images can still be stitched together manually using masks - a technique I will describe in the Photoshop II workshop. Finally in order to stitch a series of RAW files into a panorama your computer will need a lot of memory so either convert your images in JPG files before you stitch them or be prepared to buy more memory for your computer!

 See panoramas.mov

## Archiving and printing digital images

Once you have completed working on your digital images – you should save them onto your hard drive as TIF files. If the files were in 16 bit mode reduce them to 8 bit mode for final printing – (Select Image>Mode> change 16 bit to 8 bit) this will also reduce the overall file size of the images by half. If you require a JPG file, open the TIF file in Photoshop and select save as JPG or save for web if the images are destined for email or the web. When you save a file as JPG format the program compresses the file and throws out data. If you save a JPG file multiple times, each time it is saved it will toss out more data and your image begins to deteriorate resulting in JPG artifacts – so don't save a JPG files multiple times save them as a TIF file which you can save as many times as you like and if you need a JPG file open the TIF and save it as a JPG. Also never throw out your RAW files! Software for processing these files continues to improve – you may be able to make even better images with them in the future. Also your RAW files include your EXIF data i.e. date, F-stop, lens used etc. If you select save for Web you images should be at 72 dpi and also select the option convert to sRGB mode so they appear good on non-calibrated computer monitors.

To archive your valuable files use a good quality CD or DVD and if possible burn two copies and store them in different places – set the CDs upright and preferably store them in the dark. If you have a lot of images I recommend purchasing two identical external hard drives. When you save your files put a copy of each on both hard drives. If anything happens to one hard drive immediately make a backup of the other one. I no longer backup my digital photos onto DVDs or CDs as I simply have too many files and can't find specific images quickly enough from my DVD collection. Instead I use two large hard drives (2 Terabytes each) to store my digital images and I use Picasa to create an image database. When my drives fill up – I will buy another pair of large hard drives and store one of the old extra drives in a bank vault to protect them from fire and theft.

Epson Printers - suggested starting points

1. File > Print – select portrait or landscape mode and the size of the paper you want to print on.
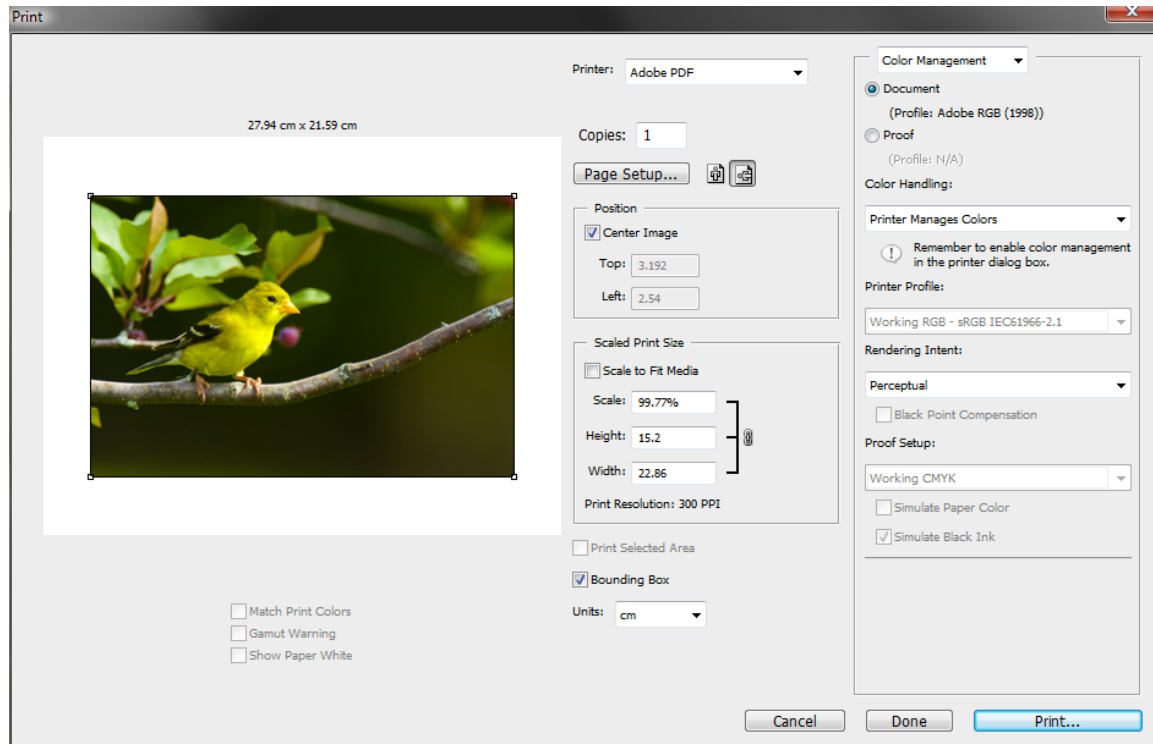
2. Make sure Colour management is turned on and select the Document Profile (Adobe RGB) - let printer manage colours.

3. Colour Handling – I use let printer determine the colours and set the rendering Intent to Perceptual, you may want to use Relative Colourimetric rendering intent - see page 9 for information on rendering intents.

4. Select Print> if you have more than one printer choose the printer e.g. Epson 2000P>Properties>Select media type e.g. Premium lustre and Custom>Advanced
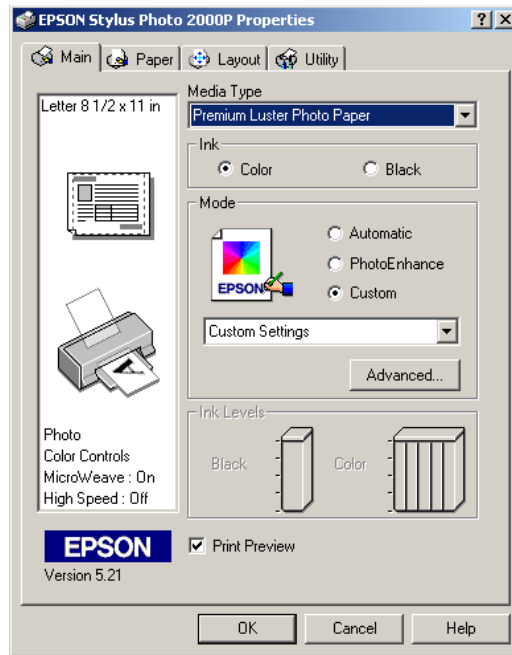
Always select Print Preview so you can see the image as a soft proof before it is sent to the printer. If the preview does not look right – stop go back and modify your printer settings or modify your image.

5. After selecting Advanced – set the colour to ICM and best quality (Super FX) - note your printer's output boxes may look different.

6. Click OK – then back in the main printer window click OK again to see the soft proof (below) this image is what you want your final print to look like.
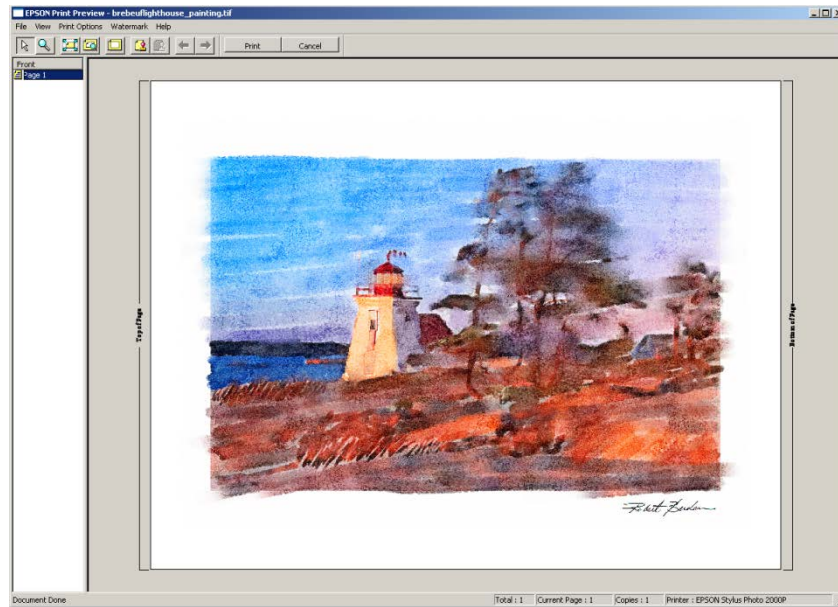
These basic guidelines are meant as a starting point only. You should take some notes as to which printer settings work best with your images and your printer so you can achieve the best results

Ink and paper can be expensive so keeping a few notes can save you money. Also I recommend printing one of the provided test images before you start making prints of your own images.

Summary & Conclusion

1. **Calibrate your monitor - it is one the most important elements in your digital workflow.**

2. **Configure Photoshop's Colour settings to use the monitor profile.**

3. **Develop a workflow that works for you so you can edit and colour correct images quickly and efficiently.**

4. **Make sure you set the resolution of your images to 200-300 ppi before sending the output to your printer – 300 ppi is the standard.**

5. **Save your files for printing in TIF format and back up your images onto CD\DVD or external hard drive – keep two copies if the images are valuable.**

6. **If you plan to sell your prints use archival quality paper and Inks in your printer, so they don't fade after a few years.**

NOTE – The Extract Filter was removed in Photoshop CS6 and replaced with the Quick Selection Tool, if you are using a newer version of Photoshop see the steps below to learn how to extract objects using this new too.

Image Extraction using a Quick Selection Tool in CS6 to CC2015.1

There are several ways to extract a subject and change the background. In earlier versions of Photoshop we used **Filter > extract** and traced around the subject. This filter, however in CS5 must be added manually from the Goodies folder on the Software DVD and most folks never even investigate these additional free filters. Adobe has a new way to extract objects using the quick mask took that does a similar job and is described below.

1. Open an image with an animal or person you want to extract and modify the background. For this tutorial I am supplying an image of a bald eagle.

2. Select the Quick Selection tool in the tools palette and paint inside the eagle to select just the eagle. From the top, tool properties options bar you can select + or – brush to add or subtract from your selection.
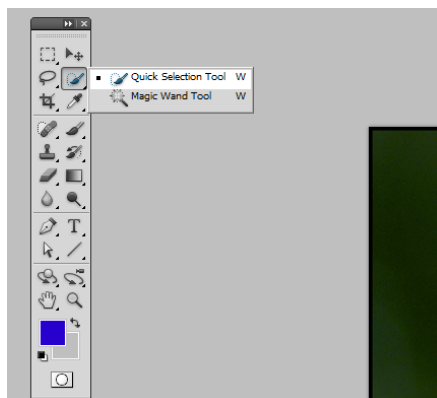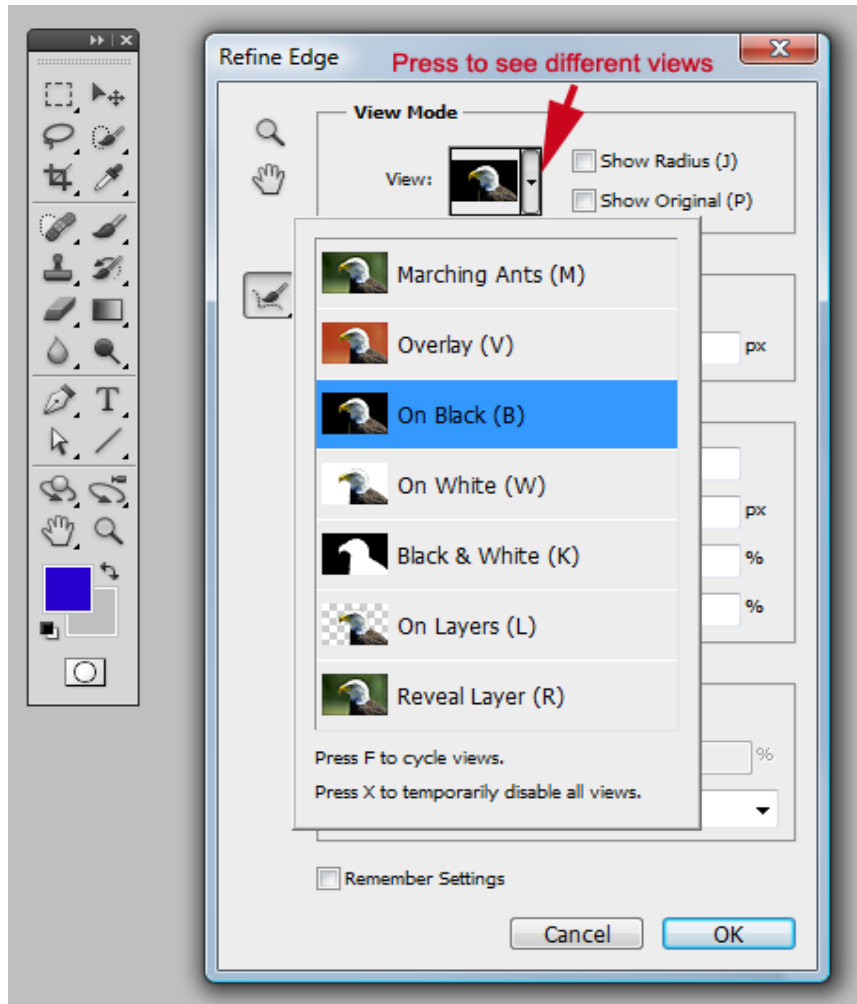

Quick Selection tool
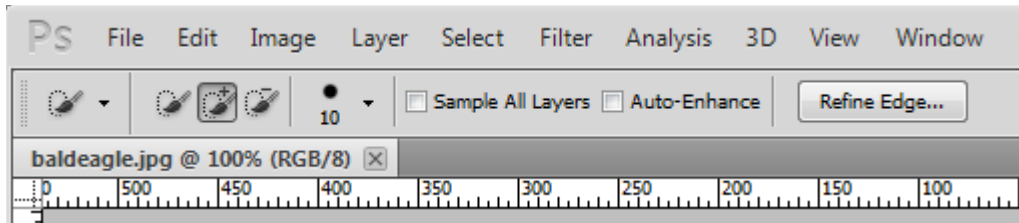
Top +, - quick selection brushes allow you to add or subtract from your selection

3. Once you made your selection, at the top of Photoshop, in the tool properties options bar, press Refine Edge.

Refine Edge Box – Select to view the selected object on different backgrounds

4. In the Refine Edge box (below the pop down View menu) are a number of options that you can use to make the selected edge smoother, or contract the edge. In the Adjust Edge section of the Refine Edge box, adjust the sliders smooth, feather, contract and shift edge to see how it affects the selection. Often you can improve the edge. Decontaminate colours can sometimes eliminate extra colour on the edge remaining

from the background. Sometimes changing the View mode can also be helpful when you refine the edge of your selection.
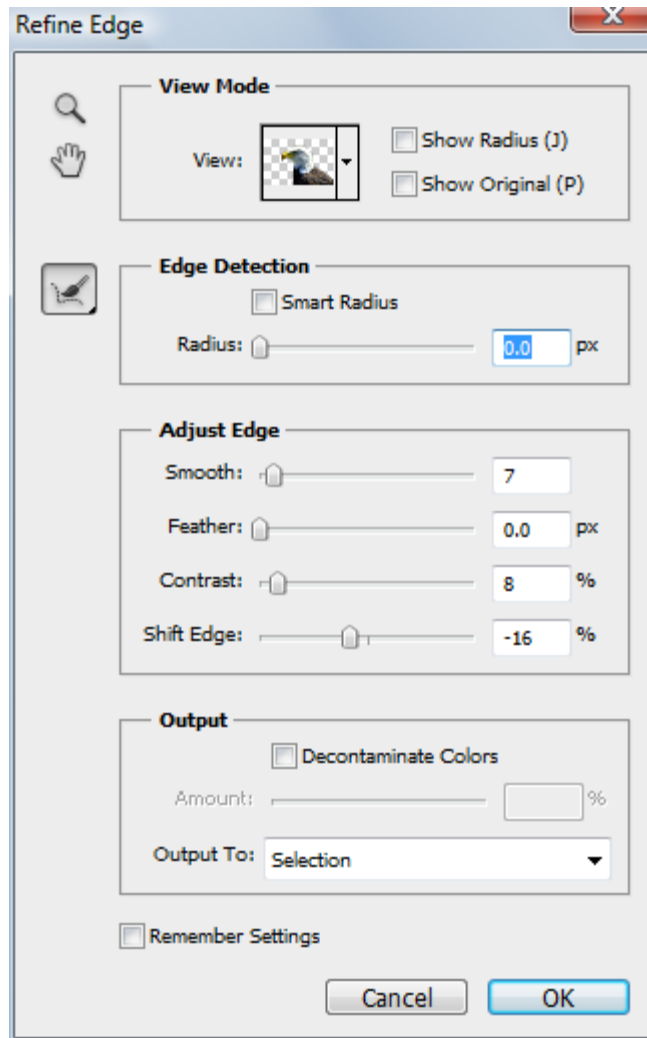
Adjust Edge sliders allow you to move the edge inside or outside of the selection

5. In the box above, select the refine radius tool – brush left of Edge Detection. This brush allows you to add back fine detail and\or remove some of the background colour around the edge of your subject.
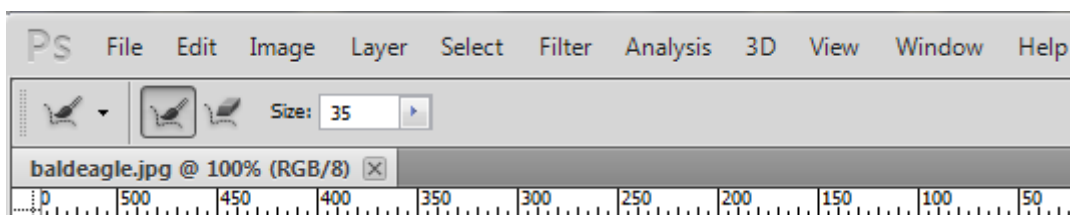
At the top in the options bars when you select the Refine radius tool you can select add bruch (selected) or subtract background pixels (eraser). You can also vary the radius of the brush.

6. With the refine radius tool, select the add brush tool as shown above and paint around the edge of the eagle's head, this should get rid of some of the extra background green pixels around surrounding the feathers. Experiment with both the brush and eraser tools on the edge of the eagle. When you are finished in the Refine Edge box select OK.

7. You should see the eagle with a marque selection around it. To eliminate the background Select the Masks Tab Choose Window > Masks if the masks panel isn't open. Click on the pixel mask button on the top right as shown below. This will extract the background so it appears checkered. A checkered background indicates areas of the picture that are transparent.
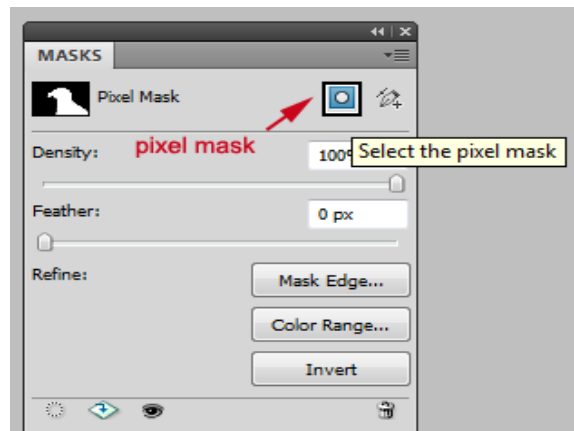
Masks Tab – select pixel mask to eliminate the background.

8. The layers palette shows a mask in black and white in the layers palette. To apply the mask and remove the background from the picture – place your cursor on the mask in the layer, right click on the mask and **select > Apply layer mask**.
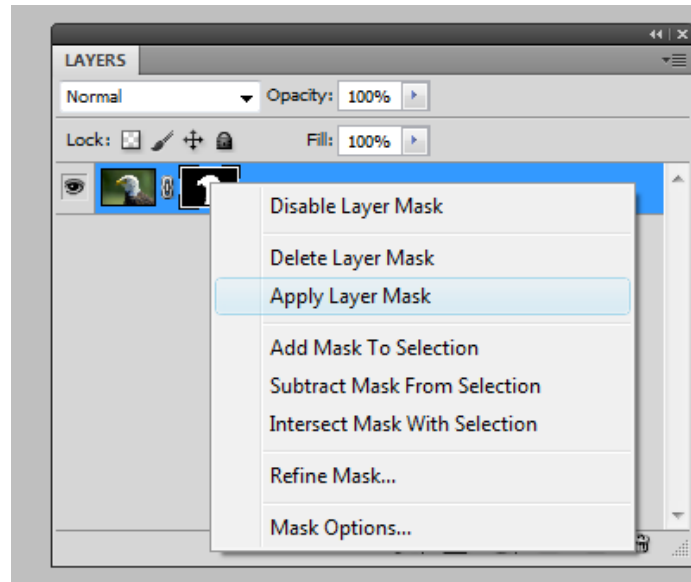
Right click on the Mask and select Apply layer mask from the popup menu to remove the background. The mask will disappear and only the eagle will be visible on a checkered (transparent background).

9. Once the background is removed you can drag (use the move tool) or select and copy the eagle to another image. You can also create a new layer, drag it below the eagle and then fill the new layer with a solid colour or gradient.

10. To place the eagle onto another image, open up another picture e.g. eaglesinatree.tif that you want to drag the eagle onto. Click on top to view Windows 2 up or select float all windows.
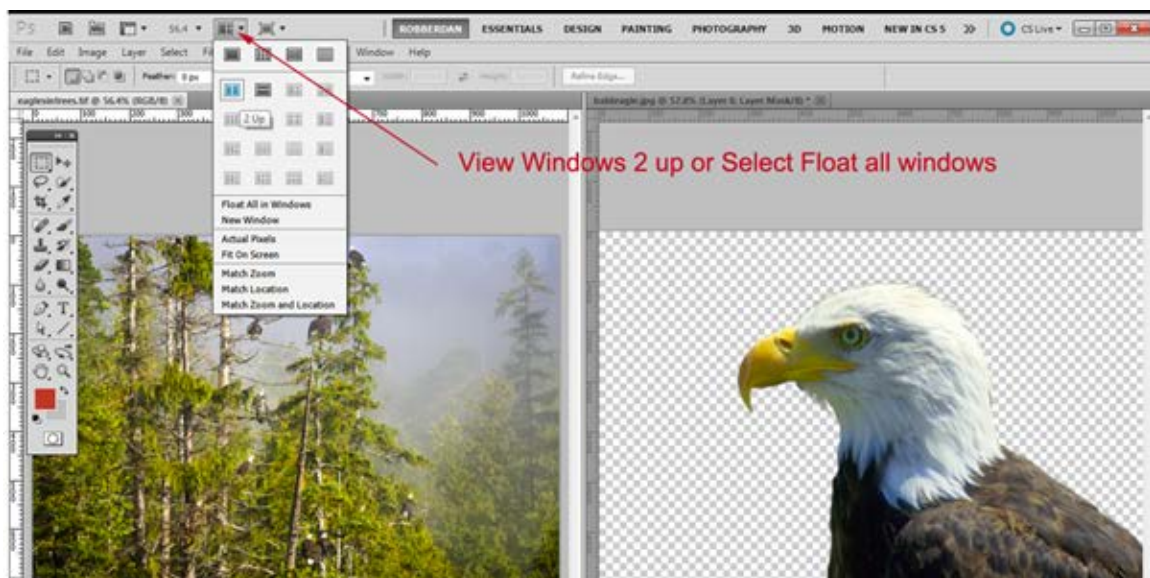
11. In the tools palette, select the move tool (top right, the cross with arrows), click on the eagle, hold the mouse down and drag the eagle over the new picture, when the eagle is visible release the mouse. You can move the eagle around with the move tool, you can

also resize the eagle (Ctrl-T) or select **Edit > Free Transfrom** and drag the handles. You can even flip the eagle over by selecting **Edit > Free Transform** select a handle (square) on the right side of the selection and drag it left.

Hockney Style Collages in Photoshop

David Hockney is a famous painter and photographer who created a style of photography that involves standing in one place and photographing a scene or object in pieces like a puzzle. The best way to do this is to use a medium focal length lens 50-100 mm, stand in one place, lock the exposure if possible or set the camera to manual so the exposure does not change and photograph the scene to create overlapping images. You might start at the bottom left - sweep right then move up and sweep left - and continue until the entire object is captured. Start with 8-15 images and then increase the number with experience.

"Hockney" style photograph is a montage made up of smaller images

1. With your camera stand in one place and start photographing your subject. It's important to include only part of the subject in each picture like a puzzle, but try not to miss parts of the scene. Also when you start, try not to shoot more then 20-30 images. Normally I use RAW files and open them up in Adobe Camera RAW as 1.6 Mpixel images so my computer does not run out of memory. Alternatively, if you computer has limited amount of RAM memory you may find it easier to shoot and work with .jpg images for this technique. If you do shoot .jpg files set the white balance and lock the exposure by using manual camera mode or use an exposure lock button. You can use any focal length lens, however I find that about a 100 mm telephoto lens is ideal for most subjects.

2. In Photoshop **Select File > Automate > Photomerge > Collage** and unselect the option Blend images together (we don't want to blend them). Click OK. Photoshop will put all the images onto a transparent canvas in separate layers. You can then adjust the position of the images using the move tool on some layers or delete extra layers if you have too many.

3. Select one of the images and at the bottom of the layers palette select **Stroke > Select inside > colour white > 10 pixels** (you can vary the size of the stroke depending on your image size). Then add a drop shadow to the image using FX feature at the bottom of the layers palette.

4. Then apply the stroke and drop shadow to the other layers - Alt-click and drag these effects onto each layer. (this saves time of having to stroke and add a drop shadow to each layer). Note

you don't have to add borders and a drop shadow I just like to because it enhances the separation between the images.

5. To add a white background (or any colour background), create a new layer and fill it with white or the colour of your choice and drag this layer to the bottom of the layers palette to create the background.

6. You may want to increase the Canvas size of your image - Select **Image > Canvas** size and add 1 or more inches, leave the Anchor set to the middle so the canvas increase around all sizes and you are done.

The technique is easy and fun to apply to people, animals and buildings. If you are looking for something different to try the next time you go out to shoot - try a Hockney style photo-collage.

Simulate Oil Painting with Adobe Photoshop CS5, CS6 & CC2015


Caribou on the tundra near Peterson's Point Lake in the Northwest territories - Photoshop simulated painting

Some painters use photographs as memory aids to help them paint. It is also possible for photographers to simulate an oil painting using Photoshops' new mixer brush. The results can look strikingly realistic except that your prints won't have the texture associated with a real painting and will never match their sales value - nor should they. It's simply a technique whereby you can convert you photographs into something that is more simplified and sometimes this can make for a great graphic for a book or illustration. There are

Photoshop filters that can simulate various types of artistic effects that are faster, but the fun is in making your own unique photo-painting - here is how I do it.

1. First you will need Photoshop CS5 or greater. A tablet is helpful but not necessary you can paint with your mouse.

2. Stat Photoshop and open up one of your favorite images - I recommend starting with an image that is not too complex.

3. I like to work with images between 9" x 6" x 300 dpi and 10" x 15"x 300 dpi if I plan to make a print. You can always reduce the size of you photo-painting later.

4. Open the layers palette and right click on the bottom layer and select duplicate image - you are going to work on the top layer and then blend the top layer with the bottom layer later.
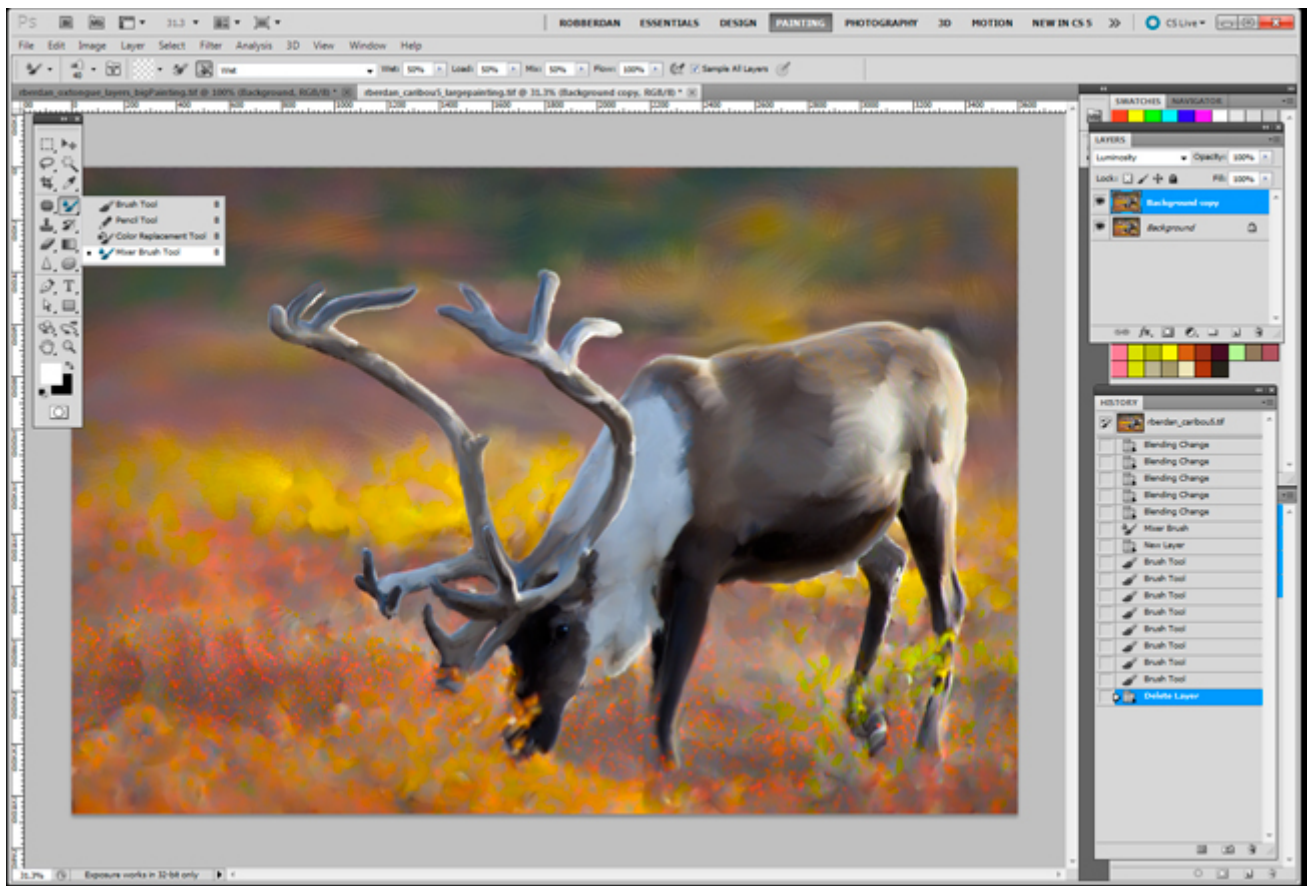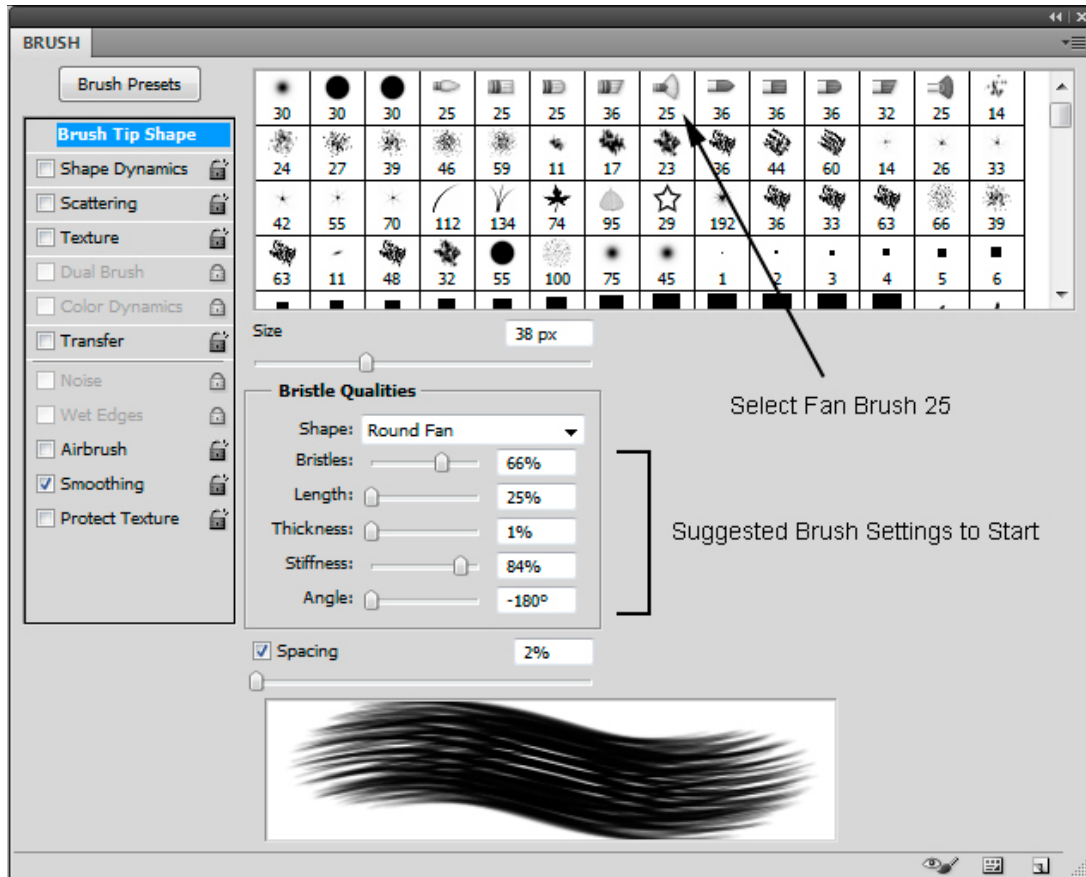

Select the Mixer Brush in the Tools palette
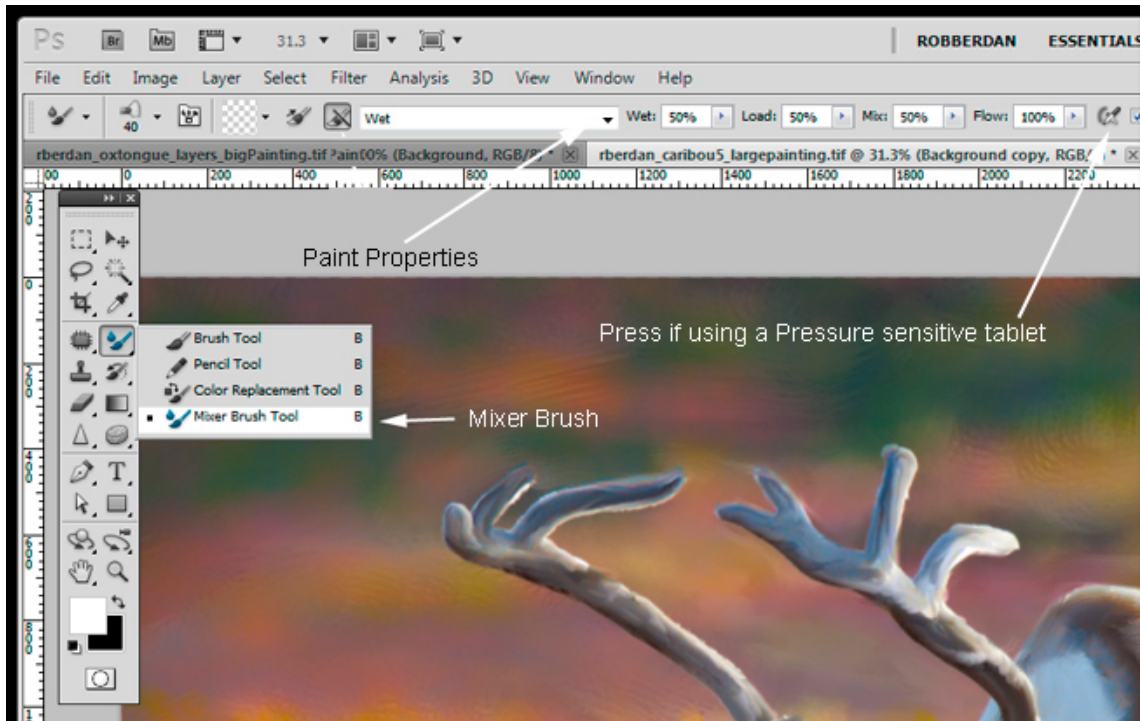
If you are using a tablet you can press the tablet button at the top right

5. Select the mixer brush in Photoshop's Tool bar and the press F5 to open the brush palette parameters box (below) and to start I used the settings below.

6. Once you selected the Mixer Brush from the tools palette and set the brush settings select the paint properties - I recommend starting with a Web brush (see below)
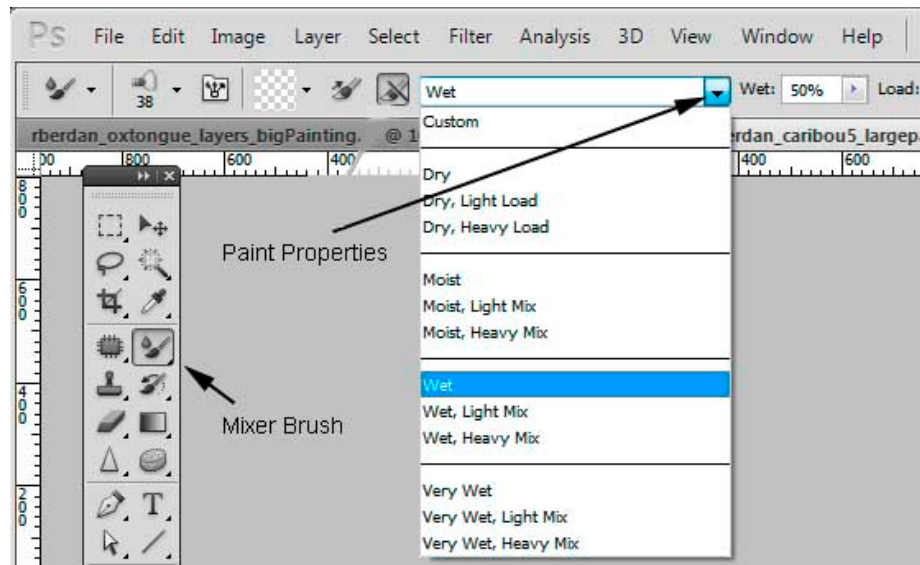

7. Using your mouse or a pen tool and graphic tablet - start painting over the image. You will have to vary your brush size depending on the detail you want to include. You might start with a circular brush movement or short straight brush movements depending on what you are painting over. Take your time - if you don't like certain strokes just backup with history palette and try again. Keep in mind you are not trying to duplicate the detail in a photograph but rather you are trying to simplify it.

8. Once your done painting, select the top layer in the layers palette and change the blending mode to Luminosity (Alternatively you can experiment with altering the Opacity). Then flatten the layers into one.
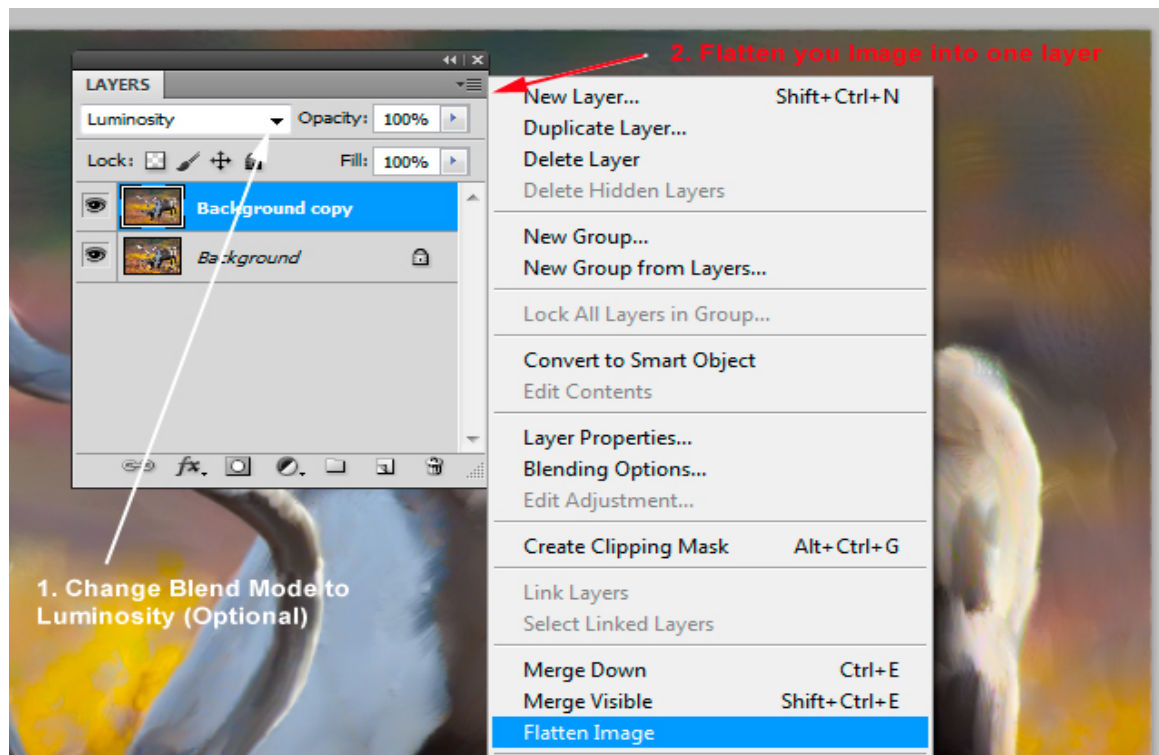
9. You may wish to sharpen the image to enhance the brush strokes. I usually select Filter>Unsharp Mask settings Threshold 0, Radius 1.0 and Amount can vary between 100-300%.
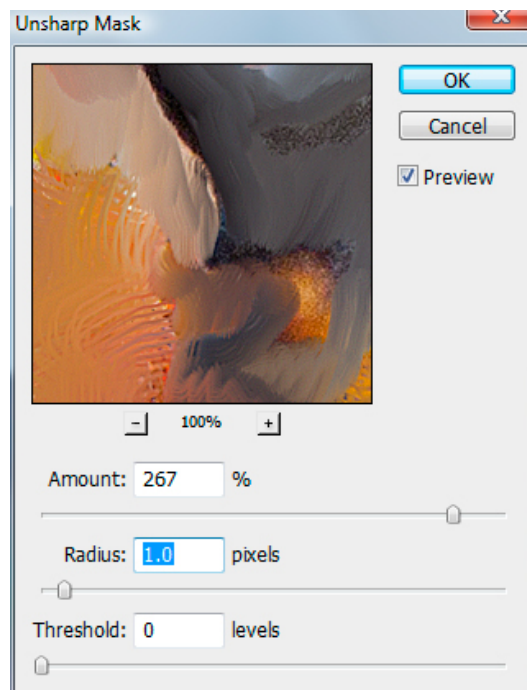
10. Finally I add my signature - I add a new layer and use the basic paint brush tool. To write smoothly I use a pen with my graphics table. It is possible to write your name with the mouse, but definitely more difficult. Save your image and\or make a print.

It takes a little bit of practice and the amount of time you spend depends on how much detail is in the original image and how much detail you want in your final painting. I typically spend 30-60 minutes per image. With a little bit of perseverance in no time you will be creating simulate paintings that may fool your friends. Who said you couldn't paint with your camera and a little help from Photoshop. RB

http://www.canadiannaturephotographer.com/painting.html

Killarney park in Ontario - shoreline at sunrise - original photograph


Killarney Shoreline - simulated painting.

Content Aware Fill available in Photoshop CS6, and CC 2015

Content Aware fill was added in Photoshop CS6 and in CC they also added content aware move. What these amazing tools do is allow you to remove subjects from a picture or fill in sections of an image that are missing so that the changes are imperceptible to the eye. I use it to remove wires, fences and sometimes even people. It is very easy to use and it has become one of Photoshop's most used tools.

1. From the content aware folder load the image of the Grizzly bear and hiker (the bear was a move star Ali Oop and the hiker is Ruth Labarge, a grizzly bear trainer from Canmore.

2. In the tools palette select a lasso tool and carefully draw around the bear leave about a few millimeters between where you draw and the bear i.e. the lasso does not have to touch the bear. When you are finished selecting with the lasso you should see a marquee or dashed line around the bear.
   .
3. To make the bear disappear, select **Edit > fill > from the fill drop down menu Select Content Aware > OK** the bear should disappear and the filled in with grass and forest. Sometimes it is necessary to use the clone tool to touch up some areas.
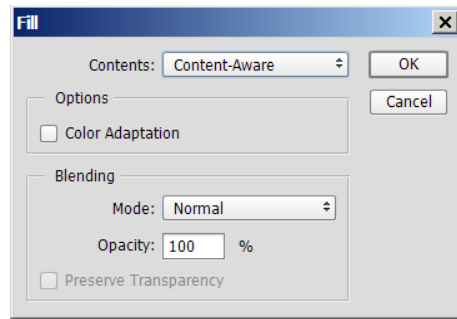
Make sure to select Content Aware from the fill palette.

4.The Content Aware move tool is in the tool palette you select the bear then drag him to a new position, the area the bear was gets filled in and the bear or other subject is blended into the new position – Truly amazing tool This will be demonstrated in class.


Final picture after I used Content Aware fill to remove both the bear and hiker.

5. In the folder you will find another picture of an owl flying – see if you can remove the fence post and barb wire – I used a rectangular selection tool to select the wire it is easier to create boxes around the thin wires – then use Content Aware fill.

Customized Tool Bar and Interface CC 2015.1

In Photoshop CC 2015 when you start up the program it looks like the screen shot below. If you want to disable that window on start up like I do – **Go to preferences > General > uncheck Show Start workspace** when no documents are open. Photoshop will then appear without this screen.
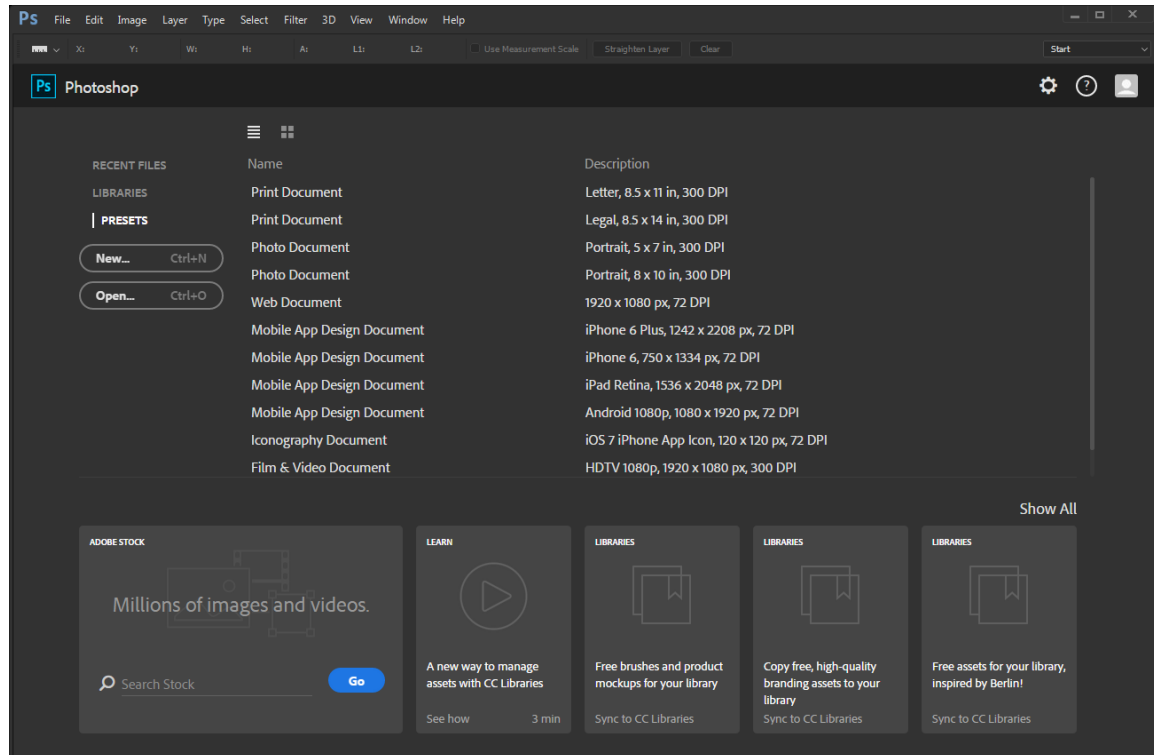

If the Main Toolbar Disappears!

If the toolbar ever disappears, you can find it and reopen it along with any other palette by **selecting > Window > Tools** – the tools feature should be checked and it will reappear.

Customizing the Toolbar Photoshop CC 2015.1 and newer versions only.

You can customize the Photoshop toolbar to organize tools in a group and do much more.

1. Do one of the following:

- Select **Edit > Toolbar**

- Long press , located at the bottom of the toolbar and then select Edit Toolbar.
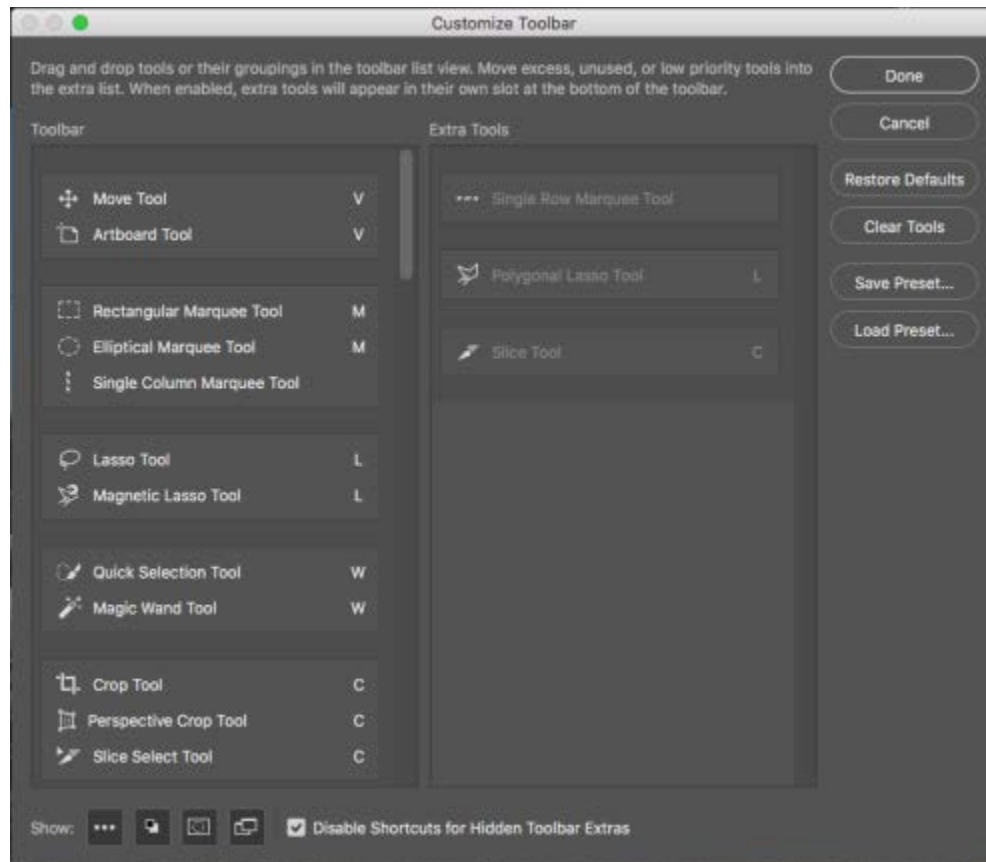
The Customize Toolbar dialog

2. In the Customize Toolbar dialog box, do one or more the following:

- Drag and drop tools and/or groups to re-organize the toolbar.

- Move excess, unused, or low priority tools to Extra Tools.

- To access extra tools, long press at the bottom of the toolbar.

- To save the custom toolbar, click Save Preset.

- To open a previously saved custom toolbar, click Load Preset.

- To restore the default toolbar, click Restore Defaults.

- To move all the tools to Extra Tools, click Clear Tools.

- Select the non-tool widgets to show/hide them at the bottom of the toolbar.

(taken from: https://helpx.adobe.com/photoshop/using/tools.html)

Problems opening RAW files in Photoshop CC 2015

Problem with some computer graphics cards won't allow you to open RAW files! To fix this problem, **Go to Edit > preferences > Camera RAW > Camera RAW** preferences box uncheck use graphics processor. Close and try again and you should be able to open RAW files. This problem occurred at one of the colleges I was teaching at and thankfully the solution was posted online. You may never have to do this – but if you do – this solution works.

Suggested Reading

 Adobe Photoshop CS Classroom in a book. Adobe press – latest edition – this is used in many college courses and has excellent follow along tutorials should be in every photographers library.In this book they often say at the beginning of a chapter to **hit CTRL + ALT + SHIFT** when starting Photoshop – this resets photoshop and its tools to the default – **don't do this unless you need to!**

Jack Davis (2008) How to Wow Photoshop CS3 for photography. Peachpit Press.

B. Fraser et al. (2005) RealWorld Color Management. Peachpit press – for Geeks that want to understand everything about colour management.

B. Fraser and J. Schewe (2008) Real World Camera Raw with Adobe Photoshop CS4, Peachpit press – there may be more recent versions get the latest edition.

Suggested web sites:

http://www.canadiannaturephotographer.com – more free Photoshop tutorials
http://www.deviantart.com - free Photoshop brushes, inspirational artwork
http://www.Photoshoptopsecret.com - training on advanced techniques
http://tv.adobe.com - free video tutorials
http://www.inkjetart.com - supplies for inkjet printers including test images
http://www.dpreview.com - in depth reviews of digital cameras

About Robert Berdan

Dr. Robert Berdan currently operates Science & Art Multimedia in Calgary, AB where he offers services in photography and private training. Robert has developed and taught a wide variety of courses on photography, web design and Photoshop at local colleges and privately in his studio. He started working with Photoshop version 1.0 in 1989, and has been teaching Photoshop for over 25 years. He started taking photos in 1970. His photos have won international acclaim from Nikon, National Geographic and Canadian Geographic. His photos have appeared in numerous magazines and books. Robert is also an adjunct assistant professor at the University of Calgary in the Dept. of Cell Biology & Anatomy since 1996. Robert enjoys teaching and sharing his passion with others.

You can view more of Robert's photography and more tutorials on his web sites:
www.canadiannaturephotographer.com
www.360vrmultimedia.com
www.scienceandart.org