

# Resizing Digital Images for Projecting

Brian Jones and Gordon Brown, September 2014

## Introduction

The reason images for digital projection need to be resized is that projectors have a specific number of pixels and an image shape which they are designed to display which is called the “native resolution”. Projectors currently have significantly fewer pixels available than most cameras as the number of pixels cameras produce is determined by the size and shape of the sensor. If you do not resize your image to match the native resolution of the projector you are at risk of unpredictable results and therefore a poor representation of your image based on the decisions that the projector, software and laptop makes on the pixels in your image.

Most standard image-editing software (Photoshop, Photoshop Elements, Lightroom, Picasa etc) include the ability to re-size an image. Where this function is located varies though, but it is usually around an ‘image’ action or the ‘export’ function.

This document gives advice and guidance for people that are new to resizing images for projecting in club competitions and covers:

- Definitions
- Dimensions of an image
- Resizing images using Photoshop
- Resizing images using Lightroom

## Definitions

- **Pixel dimensions:** Number of pixels in total in the width and height of an image
- **Pixel density:** number of pixel over a given length (usual an inch), commonly known as digits per inch (dpi)
- **Image dimensions:** the printable size of the image without stretching or compressing. Calculated from pixel dimension divided by pixel density. Therefore an image 1500px x 900px at 300 dpi is 5” x 3” ( $1500 \div 300 = 5$ ;  $900 \div 300 = 3$ )
- **Resizing:** allows us to change the *print dimensions* in terms of centimetres or inches together with the image resolution. It is only relevant when you are preparing an image for printing. When you are preparing an image for **PDI** you can completely ignore these settings
- **Resampling:** allows us to modify the dimensions of the image in terms of pixel width and height; the associated resolution has no effect upon the quality of the projected image. It is an operation that can be carried out without any consideration of the effect upon the associated *print dimensions*. ReSampling means exactly that; the number of pixels have to be resampled to insert or delete pixels to achieve the final size

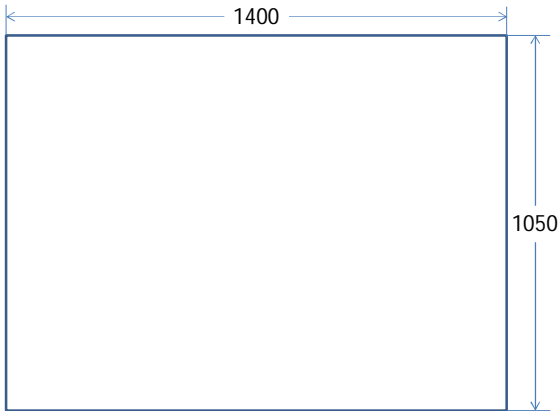
So in strict technical terms what you need to do to prepare an image for digital projection is **resample** it. The term **resizing** however has almost become ubiquitous and the de facto term for resampling and we will continue to use it (incorrectly!) in this document.

## Basic Requirements

There is often a bit of confusion when referring to image dimensions. There are two aspects associated with dimensions namely; Pixel dimensions and the dimensions in terms of inches or centimetres.

Within this document the term *dimensions* only pertains to the *pixel dimensions* of the image which are the only important values when preparing an image for projecting from a laptop through a projector onto a screen, often referred to as a projected digital image (**PDI**). Where necessary, the alternative inches or centimetres dimensions are referred to as *print dimensions*.

Most of the projectors used in camera clubs, and certainly those used by the Southern Counties Photographic Federation (SCPF), project a rectangular frame 1400px (width) by 1050px (height). Therefore the proportion of the width to the height is 1.33 (1400 divided by 1050).



Your image **must fit within this frame** (it does not have to be exactly 1400px by 1050px) but the height must not exceed 1050px and the width must not exceed 1400px.

The proportion of the width to the height is 1.33 (1400 divided by 1050).

**If Width divided by Height is less than 1.33, specify the Height as 1050**

**If Width divided by Height is more than 1.33, specify the Width as 1400**

## Trial and error method

You can, if you wish, avoid spending time looking for you calculator or trying to remember how to do long division by adopting the following “trial and error” approach (this only works in Photoshop).

Adjust one of the dimensions to the corresponding projector height or width and check that the other value, automatically created by Photoshop, is valid.

Example

Set the width to 1400.

If the corresponding height calculated is greater than 1050, simply set the height to 1050 and the width will automatically reduce to 1400 or less.

OR

Set the height to 1050.

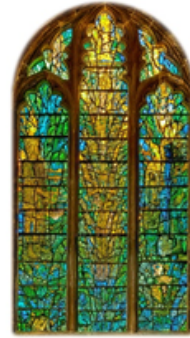
If the corresponding width is greater than 1400, simply set the width to 1400 and the height will automatically reduce to 1050 or less.

**The key is you must create an image which is within the current projector dimensions.**

# Resizing images using Photoshop

## Portrait example

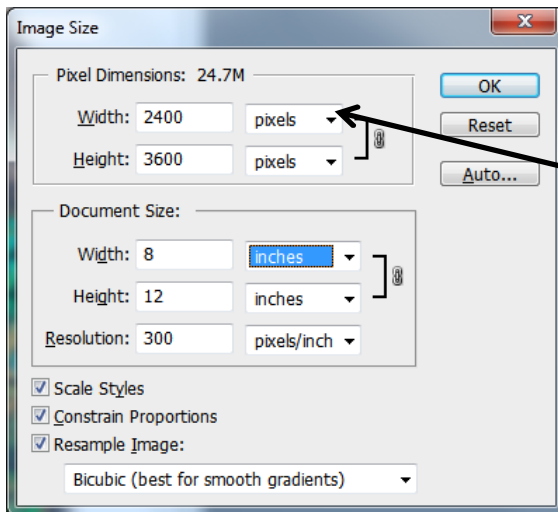
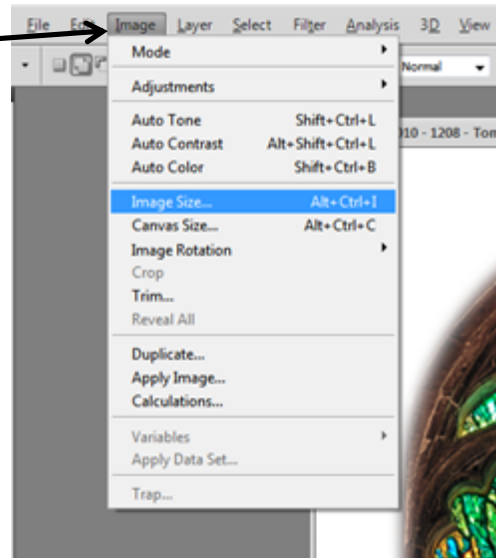
For the purposes of demonstration I am using Photoshop CS5 but the technique is the same for most versions of Photoshop.



I am going to use the portrait image shown here.

### 1) From the main menu select Image->Image Size

(Shortcut Alt+Ctrl+I)



We can now see the original dimensions of the image – 2400px width x 3600px height.

We are only interested in the pixel dimensions so we can ignore these settings

It is a good idea to leave all three of these boxes ticked but you **MUST** tick **Constrain Proportions** or else you will

end up with a stretched image.

### 2. We can now ReSize the image.

The rule is that the image must fit in the frame shown in Dimensions above.

**If Width divided by Height is less than 1.33, specify the Height as 1050**

**If Width divided by Height is more than 1.33, specify the width as 1400**

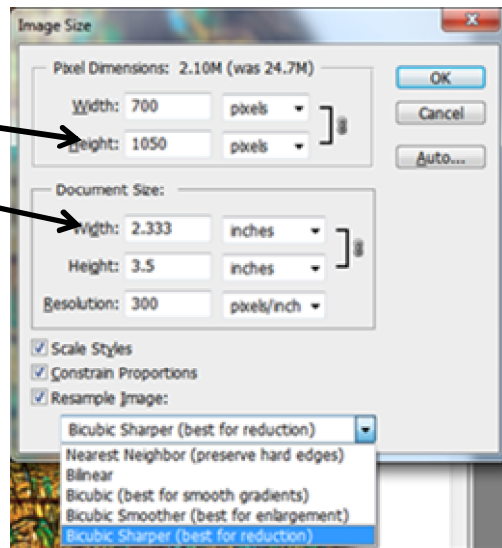
In the example here  $2400/3600=0.66$  which is less than 1.33 so we need to reduce the height to the projector height (1050px).

Adjust the height to 1050px

Ignore these settings

Indicate the resampling type from the drop down list. In most cases choose (best for reduction).

The width has now automatically reduced to 700 which means that we will have a blank area of  $(1400 - 700) / 2 = 350$  pixels on each side of the projected image.



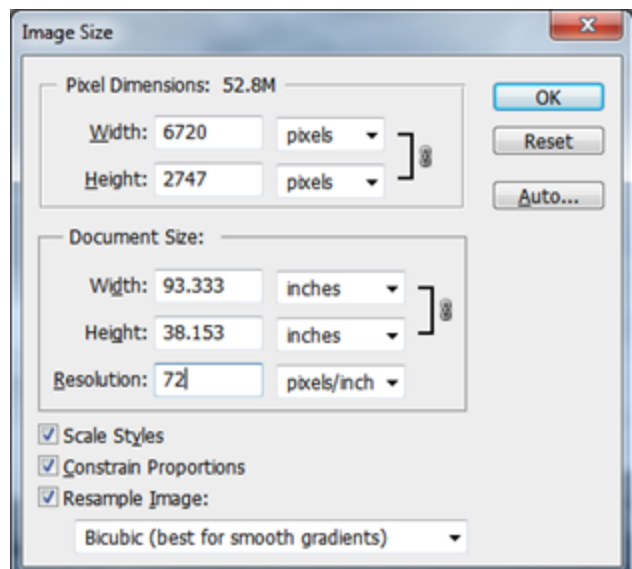
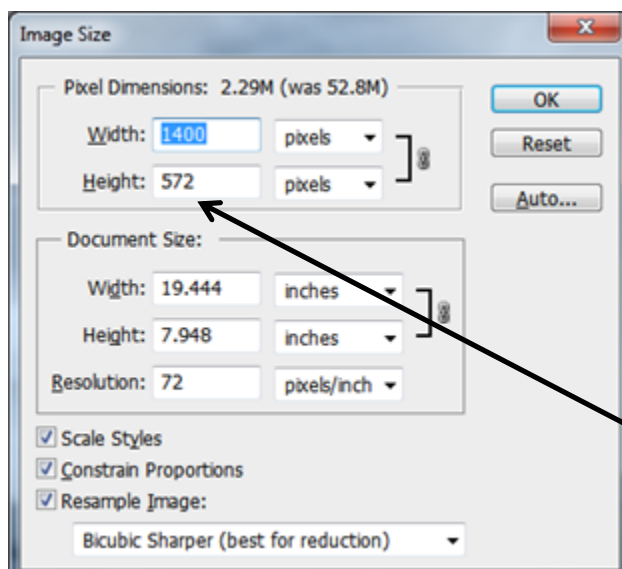
It's as simple as that – save your image as a new file.

## Landscape example



This is a letterbox image 6720px by 2747px.

Width/Height is  $6720/2747=2.44$ , this is larger than 1.3 so we reduce the width to the projector width 1400px.

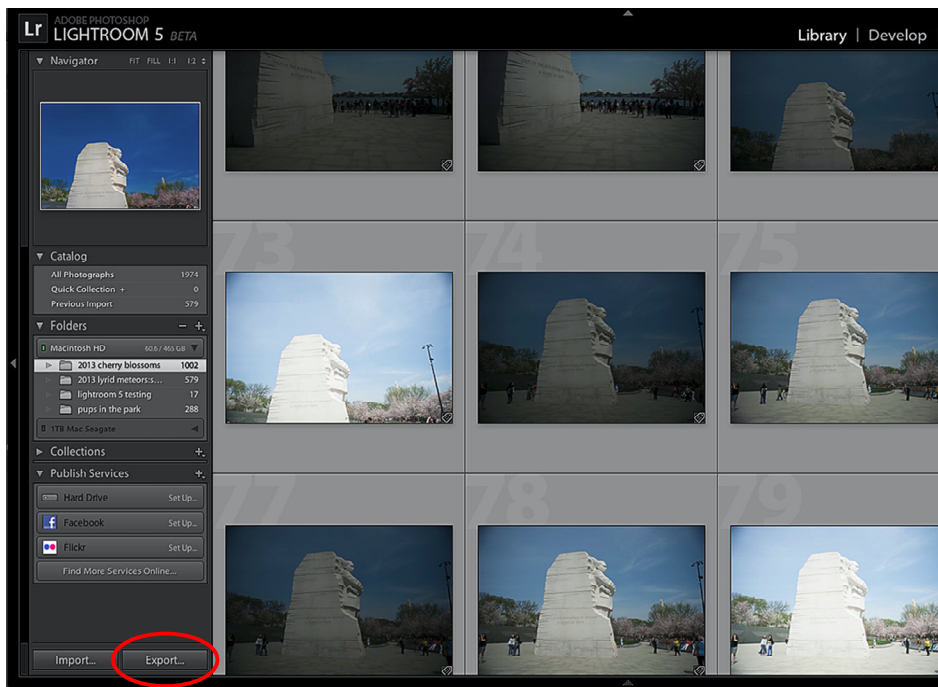


The height is automatically reduced to 572px and we have selected the best resizing method for reduction.

It's as simple as that – save your image as a new file.

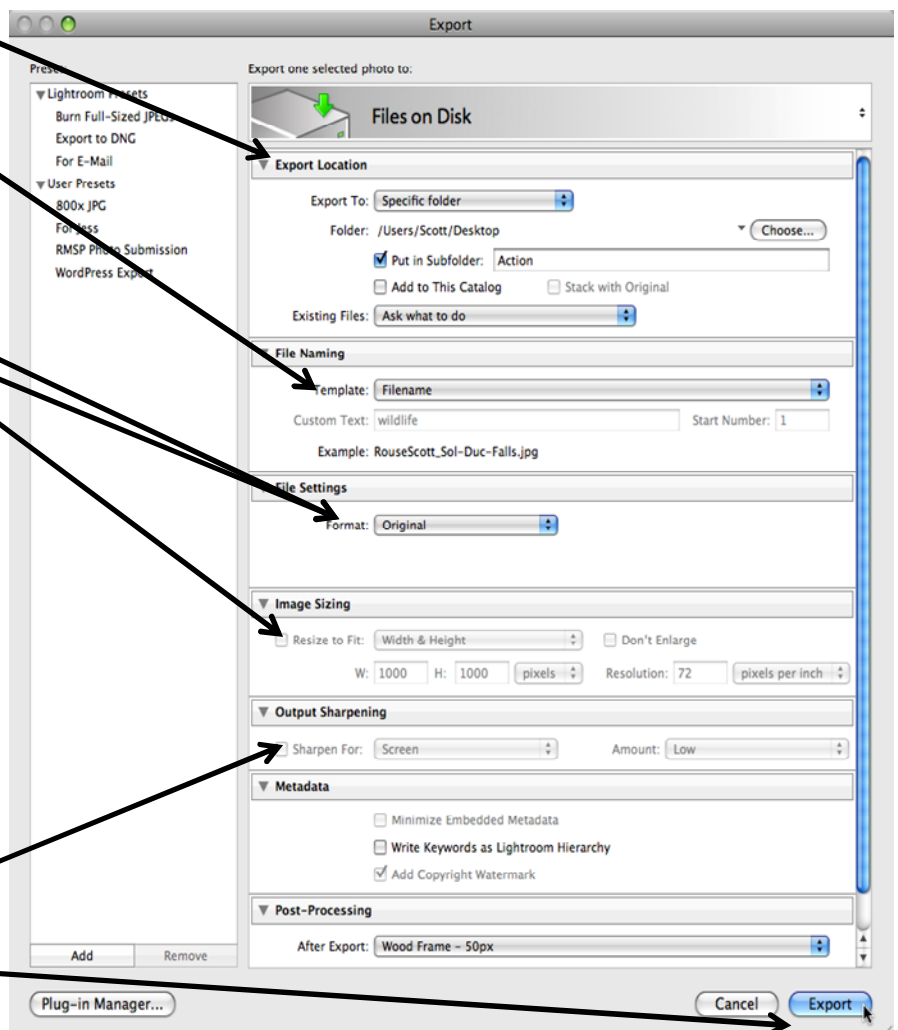
# Resizing images using Lightroom

1. Go to the Library module (ctrl+alt+1) and click the Export button bottom left of the screen:



This is the Export screen:

1. **Destination:** You'll need to specify where you want the resized file to be stored. Maybe you have a folder for all your competition entries
2. **File Name:** Give it a name that you will recognise, this could be the actual name you'll use when submitting the image
3. **File format:** Specify jpeg
4. **Colour space:** Specify sRGB
5. **File size:** You'll need to do your calculation (see above) to determine whether it's the long edge or the short edge you need to specify. Having decided which pick the right one from the drop down box (the example shows Long Edge) and then specify either 1400 or 1050 pixels. The resolution should be 300 dpi  
**If Width divided by Height is less than 1.33, specify the Height as 1050**  
**If Width divided by Height is more than 1.33, specify the width as 1400**
6. **Sharpening:** It is not recommended to adjust this value
7. Click **Export** and then find your image in the destination folder and



follow the submission instructions.