THE SHERIDAN GROUP

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Digital Expert™

And Then There Were Three...
Part two of a three document series reviewing a selection of common image preflighting errors

Introduction
The intent of this series is to review and provide solutions for a sampling of common problems encountered when using the *Digital Expert™* tool, or systems integrated with *Digital Expert™*, to preflight image files. This document addresses the topic of **Inadequate Image Resolution***.* There are several different applications for working with image files, but the examples chosen for this document use the most popular raster graphics application program, *Adobe Photoshop®*.

Part Two: Conquering Inadequate Image Resolution

### Understanding Image Size and Resolution
Understanding the relationship between an image's pixel dimensions and its print resolution is helpful for producing high-quality results. The amount of detail in an image is dependent upon its *pixel dimensions*, while the *image resolution* controls how much space the pixels are printed within.

When printed, an image with higher resolution contains more, and therefore smaller, pixels than an image with low resolution. Higher-resolution images can reproduce more detail and subtler color transitions than lower-resolution images because of the density of the pixels in the image. High-quality images often look good at any print size.

A lower-quality image cannot be improved by printing at a higher resolution. Changing the print resolution of an image simply makes each pixel larger and does not add any pixel information, which results in pixelation-- output with coarse-looking pixels *(see example below)*. A low-resolution image can be made to look its best by picking a print size that makes the most of the pixels it has... and it is primarily this technique which will be explored within this tutorial.

*This image will be used as an example throughout the tutorial.*
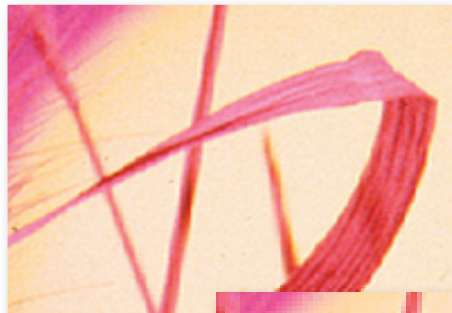
Examples of high and low resolution: *Note the better detail in the above higher-resolution image versus the pixelated low-resolution version below.*

## Enhancing an Image Using the Image Size Dialog Box

Using *Adobe Photoshop*®, let's determine the pixel dimensions, physical dimensions, and resolution of the image. *Digital Expert*™ has flagged the 155ppi resolution in this image as inadequate for print-production at its current dimensions. A technique will be used to increase the image's resolution so that it can be used successfully for print... and it will only take a small modification...
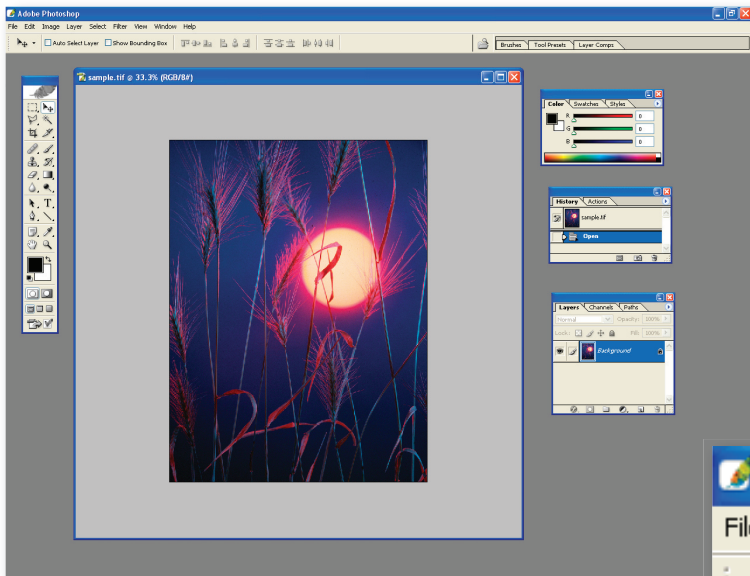
● Begin by opening the image with *Adobe Photoshop*®. Select **(File->Open...)**.
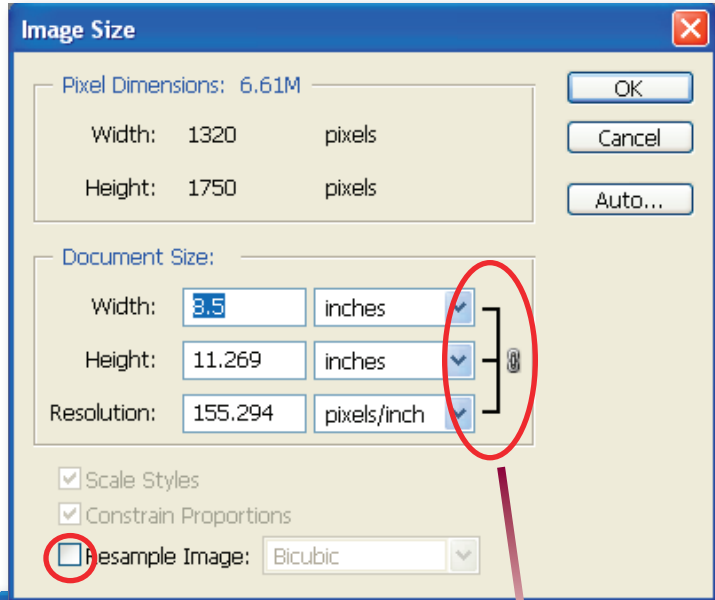
● Select **(Image->Image Size)**.

● The Image Size dialog box allows the modification of pixel dimensions, width/height dimensions, and image resolution. For print-production purposes, the focus will be on the **Document Size** area in the middle of the window.
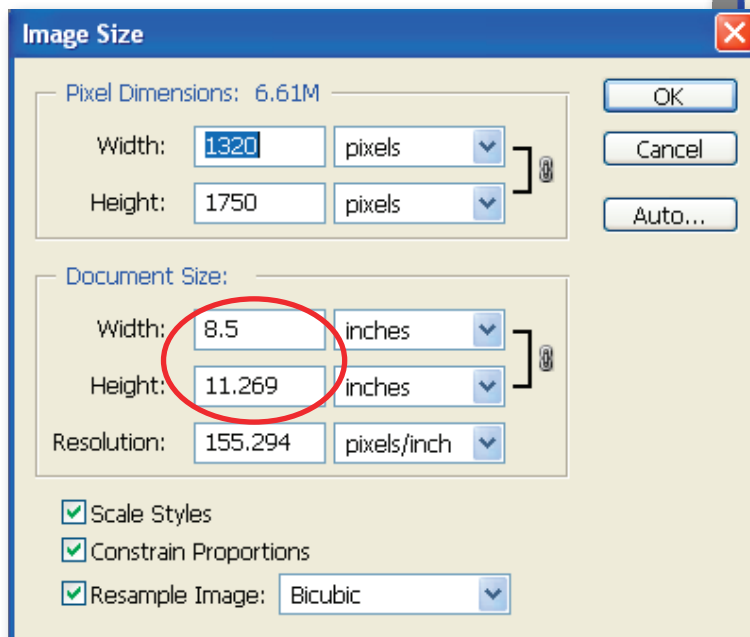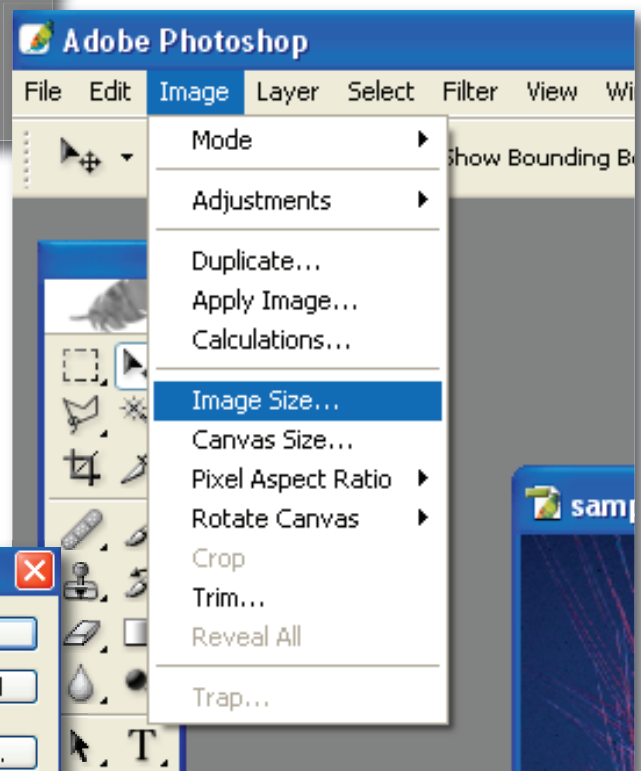
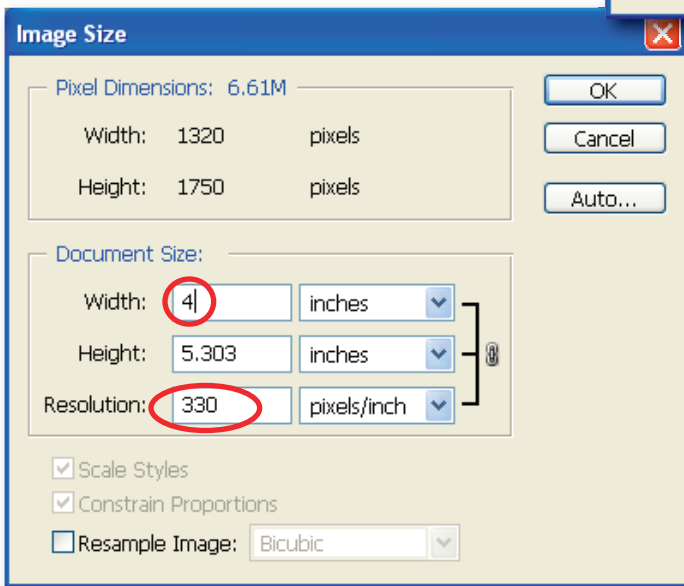● Since the image exists at <300ppi print resolution, it was flagged. However, upon further examination it is found that the overall image dimensions are 8.5″ x 11.269″, and this is far greater than what the final size of the printed image will be. The necessary final printed width will be less than half of that: **4″**.

Image resolution can be effectively increased if physical dimensions are scaled down.

● In order to avoid resampling of the image, deselect *Resample Image*. Otherwise, changing the physical dimensions will have no effect on the resolution.

Image Size

Pixel Dimensions: 6.61M

Width: 1320 pixels

Height: 1750 pixels

Document Size:

Width: 3.5 inches

Height: 11.269 inches

Resolution: 155.294 pixels/inch

☑ Scale Styles
☑ Constrain Proportions
☐ Resample Image: Bicubic

[OK] [Cancel] [Auto...]

Note the chain/brackets on the side indicating width and height are now linked to resolution.

Image Size

Pixel Dimensions: 6.61M

Width: 1320 pixels

Height: 1750 pixels

Document Size:

Width: 4 inches

Height: 5.303 inches

Resolution: 330 pixels/inch

☑ Scale Styles
☑ Constrain Proportions
☐ Resample Image: Bicubic

[OK] [Cancel] [Auto...]

● When a final width of 4″ is input, the resolution value increases to 330ppi, more than adequate for printing a halftone image.

● Resave the image in TIFF format at the higher resolution.

Commonly Used Resolution Values

In most cases, an image's resolution value should correspond to its classification. For print-production, there are three types of image classifications: **Monochrome** (Bitmap, 1-bit, Lineart), **Tone**, and **Combination Tone** (Combo). Below is a list of characteristics and recommended resolution values to achieve optimum print quality with each type:

Monochrome (900-1200ppi): Monochrome images are black and white only (no shades of gray), and usually consist of just text and lines; monochrome image resolution should ideally equal the output of the destination device (platesetters commonly output at 2400dpi); however, since no significant visible improvement can be discerned between 900-1200 and 2400, the former is recommended to keep file size within reason

Tone (300ppi): Tone images are usually captured from continuous-tone photographs, and comprised of 8-bit data; they can be color or black/white, and an image without any text or lines would be a typical example

Combination Tone (500-900ppi): Combo images are similar to regular tone images, only they contain text and/or line elements which benefit from higher-than-tone resolution to counter the effect of aliasing (stair-stepped appearance, or jaggedness); an example would be a photograph with labeling outside of its boundaries.
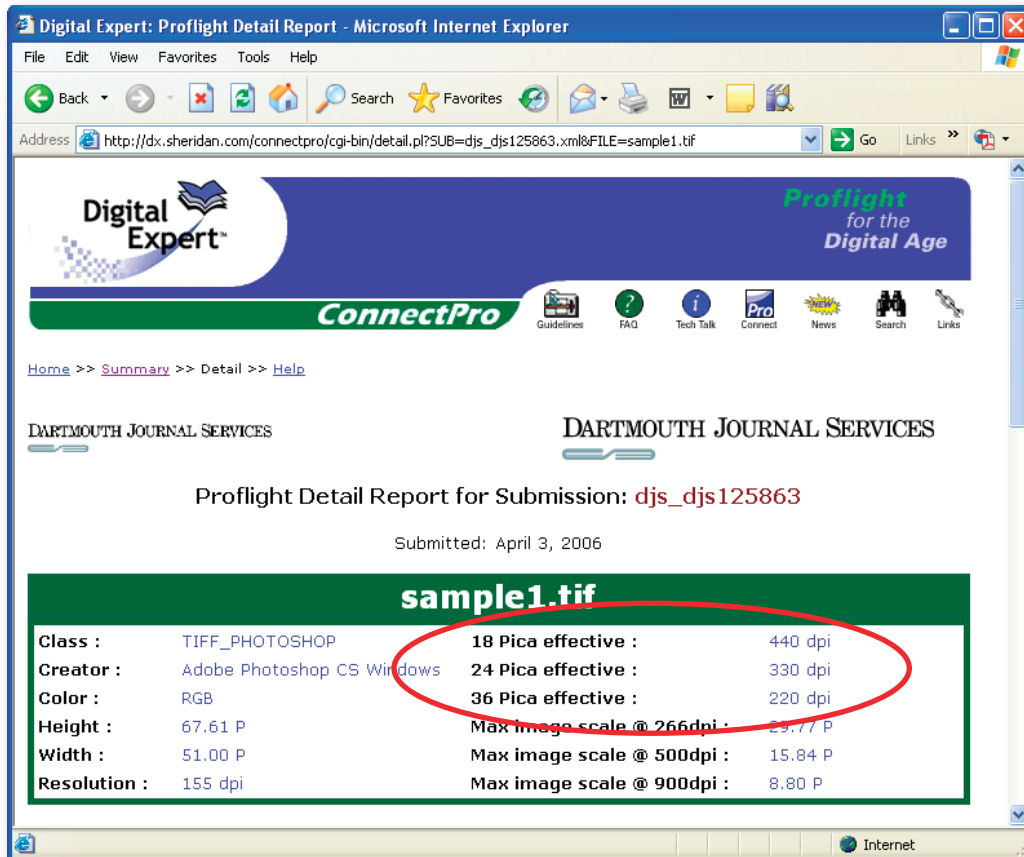
Digital Expert™ preflight reports display "effective" resolutions at various final width dimensions

Effective Resolution

Effective resolution, as opposed to actual resolution, indicates a theoretical value that the image would exist at if scaled down within a page-layout program. *Digital Expert™* lists effective resolution values at common 18p, 24p, and 36p final width dimensions. Remember-- when an image's physical dimensions are decreased, its resolution increases, and vice versa. Reading the effective resolution is a quick way to learn how much of a difference in actual resolution that resizing the image would make.

The effective resolution formula is:
[actual image resolution] / [scaling percentage] = [effective resolution]

Example: *150ppi / .75 = 200ppi*

Summary

Adobe Photoshop® CS running on a *Windows XP* platform was used to generate the example screenshots for this tutorial. Other versions of *Photoshop®* may contain menus that slightly differ, however, all critical parameters and options used herein are available in previous versions.

Feedback

This document is designed as reference material to assist in remedying digital file problems encountered using the *Digital Expert™* tool, but the goal is also to develop solutions and techniques that can work well within a broad range of online and print-production workflows. Therefore, we welcome your suggestions if you feel there is something that can be improved upon, and welcome any questions you may have concerning the data contained within.

Please address any feedback to: dxconnectpro@tsg.sheridan.com