

# HDR



High Dynamic Range: As I see it. Or how I used to see it until I started studying this technique again.

# What is HDR

- HDR is a technique that can help create images that appear more lifelike.
- Because the





# No need to limit your camera or your self

The human eye can see so much more than a single shot from your camera! It is said there is no need to accept the limitations of your camera. You can use the camera in a simple and innovative way to replicate what the eye can do. You'll be using a combination of the camera and some software to achieve the final look.

The human eye can see about 11 *stops of light*.

*A stop is a measurable amount of light.*

*A camera can see about 3 stops of light.*

*This means you'll be setting up your camera to take multiple photos of a scene, all at different shutter speeds, so you get the full range of light.*

*Don't worry, it's easy!*



How do we create an HDR Image?

What is exposure blending?

What is Tone Mapping

- There are a few terms for the art of HDR. But there are many more ways of achieving the end goal. Most begin with **BRACKETING**.





# Exposure compensation @ -2 and +2



# Manual Bracketing

- *If auto bracketing is not possible or you lost your camera's manual, you can bracket your exposures manually.*
- *The key to bracketing is always maintain the same aperture or you will have inconsistent depth of field!*
- *Your shutter speed will be the variant.*
- *Therefore, shoot in aperture mode for simplicity, and adjust your shutter speed 2 stops each side of "normal", or (evaluative).*
- *This is just the beginning for where I am personally, bracketing for different lighting situations is an incredible study! There are many mentors available on the web, some free some for fee.*





# Tips on Bracketing

- Eliminate or minimize camera shake
- Use your tripod
- Use a shutter release devise, cable electronic, or timer
- Shoot in RAW for post editing versatility and all around final quality
- Set your ISO at 100 to minimize noise since your camera is tripoded for stability
- Turn off your lens or camera's stabilizer



# Three images

Burnt  
high-  
lights



ISO 100 17mm F4 4 sec



ISO 100 17mm F4 1 sec

High-  
lights  
are  
exposed  
well,  
Nothing  
else



ISO 100 17mm F4 ¼ sec

Evaluative or base  
exposure which  
is what our  
cameras provide  
in an automatic or  
semi automatic  
mode



# Blended three photos



# HDR technique without bracketing

- Here is another reason to shoot in RAW, incase that has been suggested to you before.
- Let say you have single shot and think that would have been a great HDR.
- With RAW you have all the digital data your camera is capable of storing. You can therefore create multiple exposures in your editing software.
- This is accomplished by duplicating the RAW image two times, now you can adjust your exposure to the levels you wish , for example -2 EV and +2 EV on the other duplicate. Now you have three, essentially bracketed shots from a single RAW photo.





# Neutral Exposure shot in RAW

Photoshop File Edit Image Layer Select Filter Analysis View Window Help

Camera Raw 6.3 - Canon EOS 50D

27.1%

\_MG\_9969.CR2

Adobe RGB (1998): 8 bit; 4752 by 3168 (15.1MP); 240 ppi

Save Image... Open Object Cancel Done

The screenshot displays the Adobe Photoshop Camera Raw interface. The main image is a photograph of a red wooden wagon with white text. The text on the wagon includes "DOGVILLE WILD WEST PARK" and "NEWCASTLE TOURS CRAFTS RID". The wagon is positioned in front of a wooden building with a white cloth hanging in the background. The interface includes a top menu bar, a toolbar, a histogram, technical data (f/8, 1/6 s, ISO 250, 17-85@28 mm), and various adjustment sliders for White Balance, Exposure, Contrast, etc. The bottom of the interface shows the "Save Image..." button and the "Open Object", "Cancel", and "Done" buttons.

White Balance: As Shot

Temperature: 5000

Tint: +16

Exposure: 0.00

Recovery: 0

Fill Light: 0

Blacks: 5

Brightness: +50

Contrast: +25

Clarity: 0

Vibrance: 0

Saturation: 0

# Underexposed created in Adobe RAW @- 2.85

Photoshop File Edit Image Layer Select Filter Analysis View Window Help

Camera Raw 6.3 - Canon EOS 50D



Preview

R: --- f/8 1/6 s  
G: --- ISO 250 17-85@28 mm  
B: ---

Basic

White Balance: As Shot

Temperature 5000

Tint +16

Auto Default

Exposure -2.85

Recovery 0

Fill Light 0

Blacks 5

Brightness +50

Contrast +25

Clarity 0

Vibrance 0

Saturation 0



# Overexposed in Adobe RAW @ +2

Photoshop File Edit Image Layer Select Filter Analysis View Window Help

Camera Raw 6.3 - Canon EOS 50D

27.1%

\_MG\_9969.CR2

Adobe RGB (1998); 8 bit; 4752 by 3168 (15.1MP); 240 ppi

Save Image... Open Object Cancel Done

Camera Raw 6.3 - Canon EOS 50D

White Balance: As Shot

Temperature 5000

Tint +16

Auto Default

Exposure +2.00

Recovery 0

Fill Light 0

Blacks 5

Brightness +50

Contrast +25

Clarity 0

Vibrance 0

Saturation 0

f/8 1/6 s

ISO 250 17-85@28 mm

DOG VILLE WILD WEST PARK

905-987-2153

NEW CASTLE TOURS CRAFTS RID



# Tone Mapped in Photomatix from a single image



56mm, F 11, 1/350  
sec



Tone Mapped in Photomatix



Photoshop curves and  
unsharp mask



# Popular HDR software

- Photomatix
- NIK EFEX Pro 2
- hdr soft
- Photoshop CS
- Picturenaut
- FDRTools
- Fusion
- And many many more, most with 30 day free trial





You can't create  
a stunning  
photo in the  
digital dark  
room – you can  
only improve  
upon an  
already- proper  
image.





Straight out of Photomatix, notice the burnt out window, this can happen depending on the +2 exposure



This is the under exposed shot from  
the bracketed group





Photomatix didn't give enough detail in the shadows outside the window on this foggy day there for I brought the under exposed photo into Photoshop and masked in the window.





# Same shot different processing





# HDR in Black and White









# Surreal painting effect





**Keeping Shadows and Highlights to Increase Mood and Energy. HDR, by its very definition, serves to rescue highlights and darkened parts of a scene.**

**Our goal is to create a range of light much closer to that in the real scene than our camera is capable of catching in a single frame.**

**The trend, therefore, is for HDR photographers to avoid clipping at all costs.**

**Ultimately, shadows within our images begin to dwindle and our shots sometimes lack highlights.**

**Here's the thing, shadows are absolutely paramount in creating mood, and strong bursts of light allow our images to explode with energy.**

**In the end, without these, we can be left with flat images that simply don't move people.**





# Tone Mapping



# 8bit, 14bit, 16bit, 32bit, what does it mean to the digital photographer?

It has been recommended that we shoot RAW files for composing our HDR images. Digital photography raw files are captured at a higher bit depth — depending on the camera, 12, 14 or 16 bit, compared to 8 bit for jpegs. Whether 12, 14 or 16, these higher bit-depth files potentially contain much more information than 8 bit files. So what is bit depth?



# *Image with Bit Depth of one*

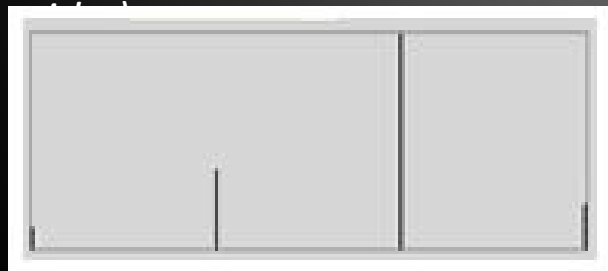
- *This image of course has very little detail, since it contains no shades of gray. If the file had a bit depth of two, there would be black, dark gray, light gray, and white:*



*Image with Bit Depth of One*

# *Image with Bit Depth of two*

*Notice that we have gained some detail, but that the image is still very choppy. In the histogram for this image, below, we see huge gaps between the tones, confirming the choppiness or posterization. (The histogram is a graph of the tones in an image, going from pure black on the left side to pure white on the right side)*

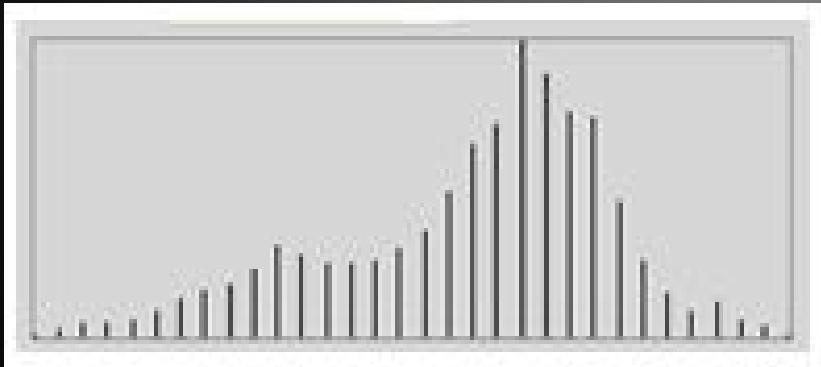


*Image with Bit Depth of 2*



# *Image from File with Bit Depth of five*

*We gain a lot of detail, but there is still obvious posterization in the sky. The histogram supports this.*

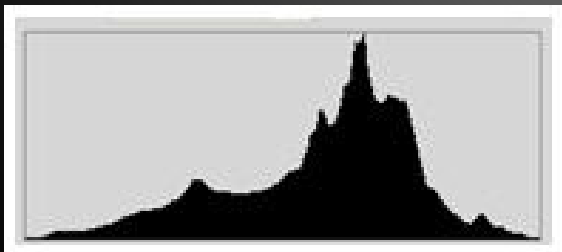


*Histogram for Image with Bit Depth of 5*



# *Image with Bit Depth of 8*

This image shows the full detail of the scene with no visible posterization, even when viewed at full size, and the histogram looks much better. So why not stop here, with 8 bits. The problem is that as soon as you start enhancing your image, you start compressing and expanding the tonal range. This creates chopiness in the histogram and potentially, visible posterization in your image.



*Histogram for Image with Bit Depth of 8*

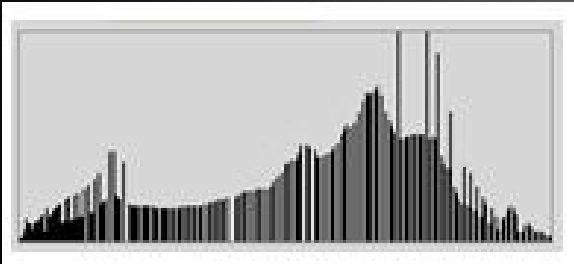




# *Histogram for Image with Bit Depth of 8 with contrast*

To show this, I took this 8 bit image into Photoshop, and added contrast and darkened it.

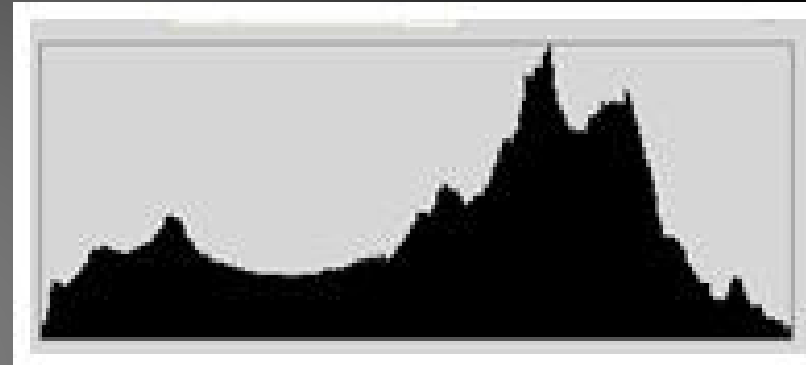
Notice how this pulled apart the histogram. The more heavy-handed your adjustments, the more and wider gaps you will end up with in your histogram, and the greater possibility that you will see posterization in your image.



*Histogram for Image with Bit  
Depth of 8 with post  
processing.*

# Bit-Depth often called color depth

- 8 bit or 256 tones is often not enough for the fine detail in the image to hold together. 12 bit files have over 4,000 tones, and 14 bit files have over 16,000. This is vastly better, and with almost any work you could do to an image, it would hold together. Here is the histogram from the 12 bit version of the above image, with the darkening and increased contrast:



*Histogram from 12 Bit Version with Darkening and Contrast Boost*





# If you want more and in-depth information

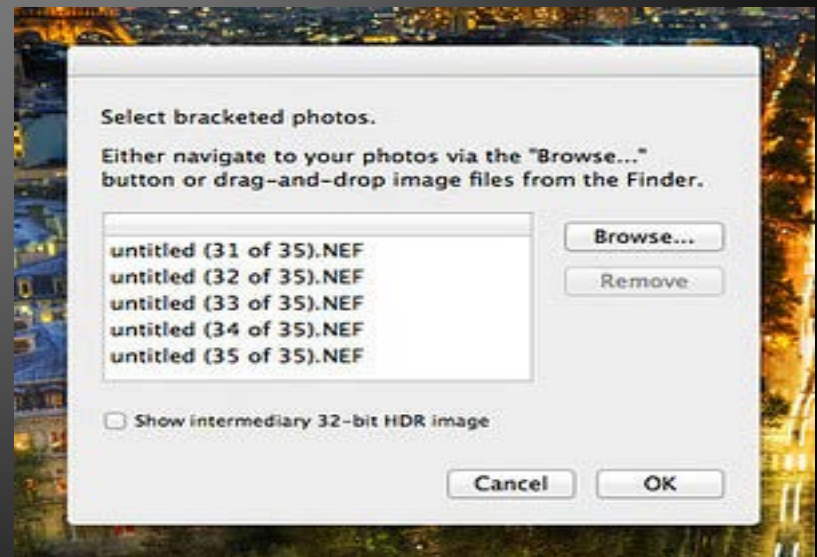
The Benefits Of Working With 16-Bit Images In Photoshop

- <http://www.photoshopessentials.com/essentials/16-bit/>



# Load photos into Photomatix

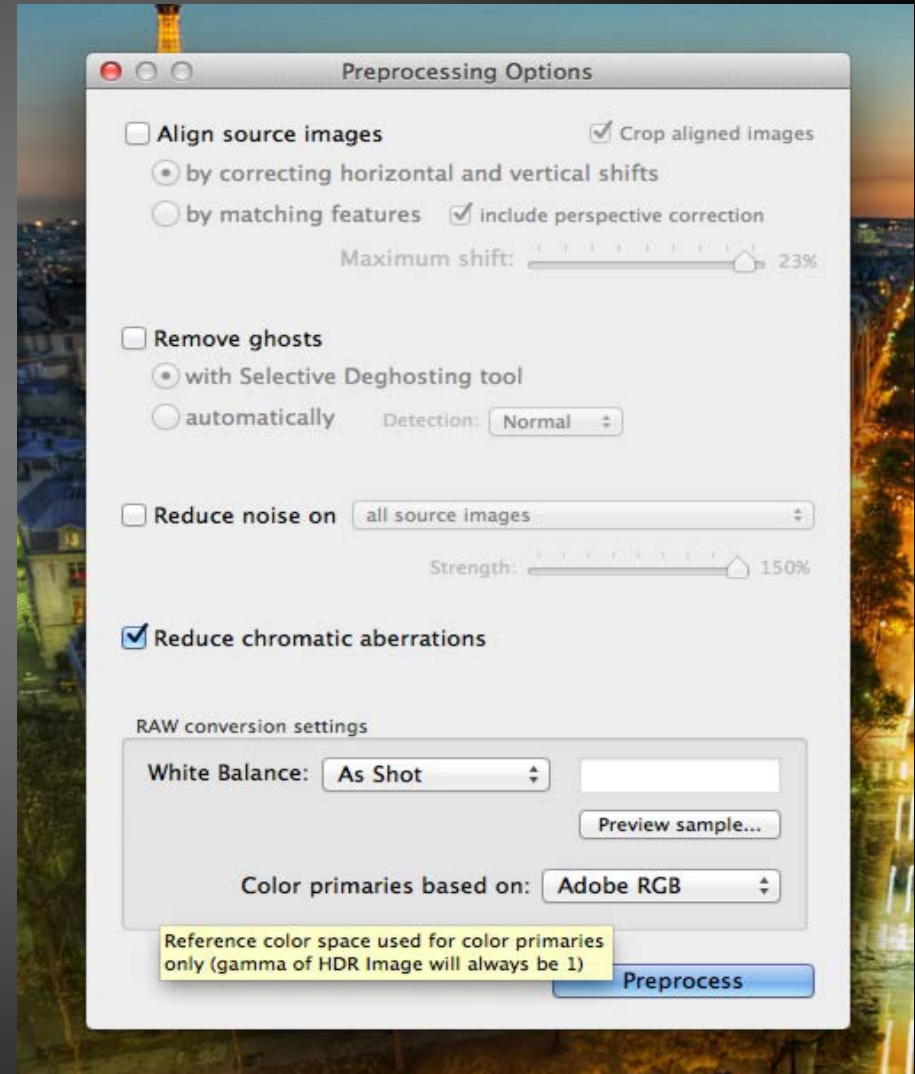
- Open up Photomatix and load in all the bracketed images. To do this, five images were dragged from Lightroom onto the Photomatix Icon, but there are many ways to do it. You can select the images from a folder or use Photomatix to load them in.





# Processing Options

- After that, you'll see this delightful dialog. It looks scary, but it is not. You are welcome to experiment with all of these areas.
- I generally click them all on, because I may have shot a month earlier, and likely won't remember which shots were which.
- If I did handheld shots without a tripod, then I would also select the first one there to auto-align, and remove ghosts.



# This is a photomatrix working screen from a web site screen shot

Adjustments - Trey-ratcliff-Queen...

Process:  Tone Mapping  
 Exposure Fusion

Method:

Brightness: 0

Tonal Range Compression: 0

Contrast Adaptation: -2.3

White Point: 2.20%

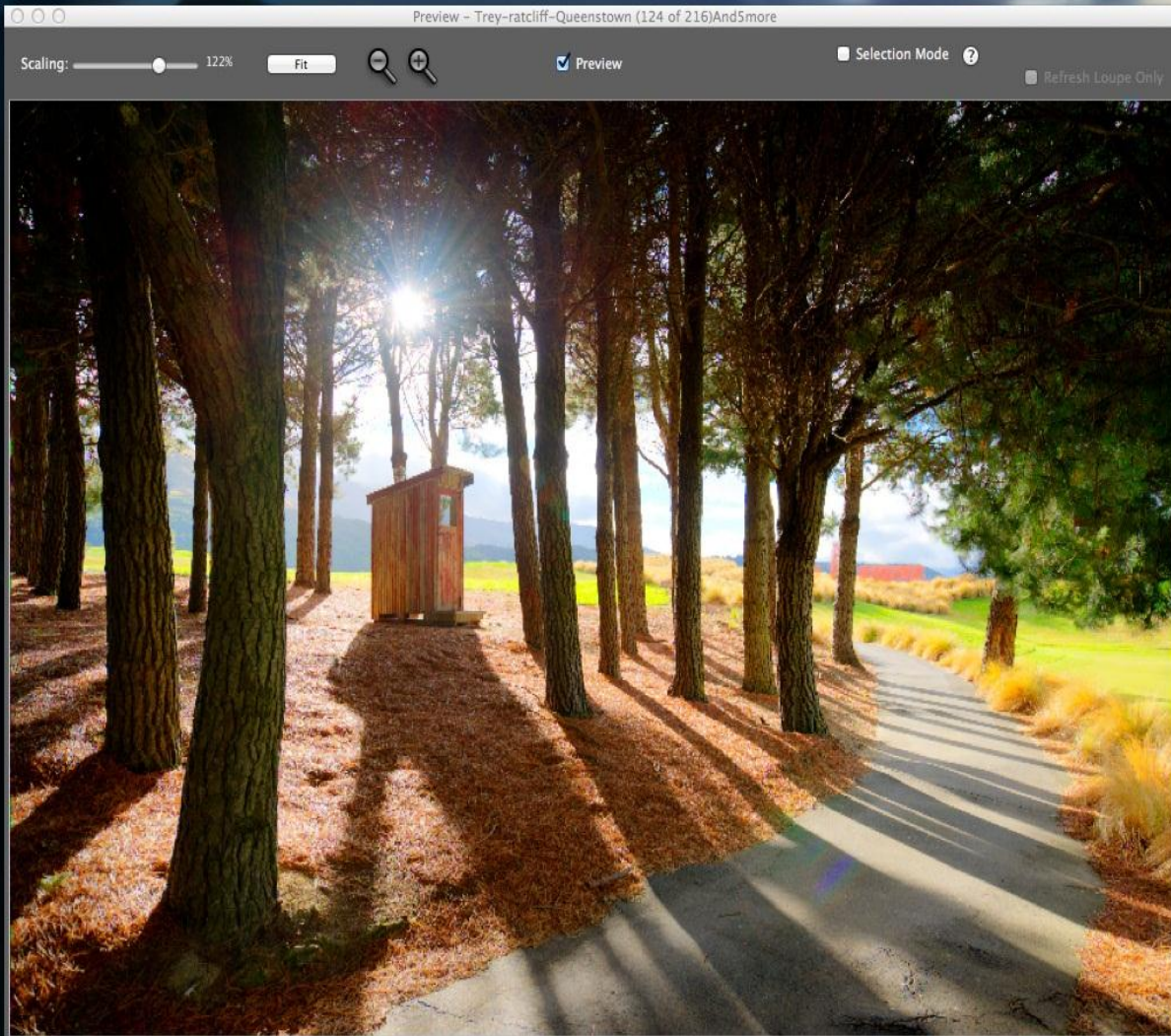
Black Point: 0.00%

Color Temperature: 0

Color Saturation: +3.8

Reset:

Preset:



Presets

All

Find Me Now

Finding U

Jamming the Lik

Mornin

Puff the Magic HDRagon

Quaint Ho

Remember When We Used To Do

Under the

White and Black

Au Na



# Panoramic HDR 15 shots

















Six shot HDR. Three shots processed individually then brought into Photoshop and masked out a portion of the overlying layer

