Creating HDR Images by Hand: Part II

Creativity in the Photoshop Darkroom by Harold Davis

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In my article Advanced Photoshop Tutorial: Multi-RAW Processing I explained that photographers can use more than one RAW processing pass to access the extended digital information contained in a single RAW photo file.

With multi-RAW processing you are not stuck with your original exposure. There are many exposures potentially embedded within each and every RAW file. In other words, you can use multi-RAW to process different parts of a photo to expose properly for each part—a life saver when some areas of an image are too dark and other areas are too bright. You can also change the color and saturation values for selected areas within a capture using multiple processing techniques.

Intro Image: I combined three exposures (at 1/2 second, 1 second and 2 seconds, each exposure at f/36 and ISO 100) to create this Hand HDR image of a rose close-up.

Multiple RAW processing is great, and there is a surprisingly large range of exposure values incorporated into each RAW capture, but there are ultimately limits even to the exposure range incorporated in a single RAW file. At the darker (underexposed) range of exposure values within a RAW file, increased noise is usually quite difficult to deal with, and at the brighter end of the internal exposure setting highlights lose all detail.

But there's absolutely no theoretical limit to the exposure range you can capture using multiple in-camera exposures—hence the advantage of HDR (High Dynamic Range) imaging. As I explained in the first part of this article, Creating HDR Images by Hand, Part I, shooting for HDR means bracketing exposures. The bracketed exposures can then be put together in post-processing in a number of different ways:

- Using automated HDR software such as Photomatix or Merge to HDR in Photoshop.
- By hand, using layers and masking in Photoshop.
- Combining a background automated HDR blend with layers created for specific areas of the image.
- In combination with multi-RAW processing techniques used on some of the captures included in the HDR layer stack.

If this sounds confusing, don't worry. It's not as complicated as it sounds! The important thing is to have a strategy that is appropriate for your particular image-creation situation. The point of this article is to show you some common situations and strategies so you'll know when to use them in your own work.

I'll be demonstrating Hand HDR with these 3 images.

Miami across Biscayne Bay   Pink Rose

Puente Bacunayugua

The Power of Layers

Before I get down to "brass tacks" let me spend a moment talking about layers, masking and hand HDR—and why they are so important.

Hand HDR in Photoshop uses layers and masking. If you understand how to use layers, then you know how to unleash the power of Photoshop. Almost everything in Photoshop is better with layers, and you can control elements of your image with precision down to the pixel level. Fortunately, effective use of layers and layer masks is not very hard to understand and to learn to use.

However, the concept of using layers and masks to control your images down to the pixel level flies in the face a powerful trend—parametric photo editing. The idea of parametric editing is to put the edits in a file associated with the original photo without altering the original photo. The benefits of parametric editing include having smaller-sized files to archive and absolute non-destructiveness of the original image. These benefits are touted by those who prefer Lightroom to Photoshop for their post-processing, or by those who'd prefer to use adjustment layers rather than plain old layers.

For the most part I prefer to use good, old-fashioned layers in Photoshop and take the hit in additional need for storage—but this is a choice you can make for yourself.

Note that whatever software you use it is very important to archive original files and save stages of your work; for a suggested workflow to accomplish this in Photoshop non-parametrically, see my book *The Photoshop Darkroom*.

There's also an interesting philosophic point at issue. With power comes responsibility. Since I can use layers and masking to control every aspect of my images down to the pixel level, I am responsible for all those pixels. "It was like that," is no longer an excuse for anything in a photo—and creatively processed captures now transcend conventional photography, or fail to live up to conventionally processed photos, depending upon whom you talk to. This is a brave new world!

Here's how layers work!

Layers are placed on top of other layers to form a layer stack. You can control the opacity of each layer, as well as the formula for how pixels in the layers are combined, called the blending mode.

A layer mask is used to hide or reveal portions of the associated layer. Black conceals the associated layer, white reveals it, and gray shades in-between pure black and full white partially reveal (or partially conceal, depending how you look on things). It's important to remember that we are talking about concealing or revealing the layer that the mask is on, not the layers below it in the stack.

You can start with a layer mask that is completely black (by choosing a *Hide All* layer mask) or completely white (by choosing *Reveal All*) and then modify the layer mask. The most common tools for layer mask modification are the Brush Tool and the Gradient Tool.

If you need to learn more about layers and masks, check out any good Photoshop book, or my book, *The Photoshop Darkroom*.

I can't overemphasize the importance of layers and masking to my Photoshop work, particularly hand HDR. Every hand HDR project I undertake uses these important

Photoshop "primitives."

Shooting for HDR

Not every subject or situation is suitable for HDR, no matter how the HDR is implemented. Generally, you want a subject that is not in motion. If things are changing too much between exposures, then it will not be so easy to implement the HDR effect.

You should also look for subjects that present a dynamic range that is beyond the ability of multiple RAW processing to handle as explained in Multi-RAW processing. A single capture has the advantage that you don't have to worry about registration—multiple image alignment—always a concern when combining multiple different exposures. Of course, with a single RAW exposure processed multiple times you don't have to worry about your subject moving between captures.

When you have a scene that is appropriate for HDR, you should plan to bracket extensively. Usually, **it is better to bracket your shutter speed rather than your aperture**. I find that I bracket using manual exposure rather than a bracketing function. I often move my exposure time by a factor of two between each bracketing exposure; for example, 1/2 of a second, 1 second, 2 seconds, and 4 seconds. If you don't shoot enough exposures, or bracket them extensively enough, you won't be gathering enough information to truly extend the dynamic range.

See the first part of this article for more information about shooting for HDR.

Choosing a Strategy

Let's say you have a perfect subject for HDR photography. You've gone ahead and bracketed, with your camera on a tripod. You have at least three RAW captures, each shot at significantly differing shutter speeds. What next?

It's important to come up with a plan as to how you are going to post-process these bracketed RAW captures.

The three strategies I most commonly use are:

- Dark to light: This means processing the darkest, most underexposed capture first, then blend successively lighter versions on top.
- Starting in the middle: If you have one exposure that is almost there, you could start by processing it. Next, you could add lighter and darker versions on top.
- Adding layers to auto-HDR: If automatic HDR gets you most of the way there, you can add a few hand-processed layers on top to get you the rest of the way.

From Dark to Light

This night scene of Miami Beach shot across Biscayne Bay presents an inescapable exposure problem if handled conventionally. The waters of the Bay are simply far darker than the lit skyline or even the swimming pool in the foreground.

The RAW night captures—shot at shutter speeds between 4 seconds and 20 seconds —shown in Adobe Bridge in Figure 2 look dark, but this can be adjusted. The contrast between the dark waters of the Bay and the bright lights of the city is another matter; but it can also be brought into line using hand HDR.

Figure 2: These four night exposures bracket from 4 seconds to 20 seconds, with each exposure at f/5.6 and ISO 100.
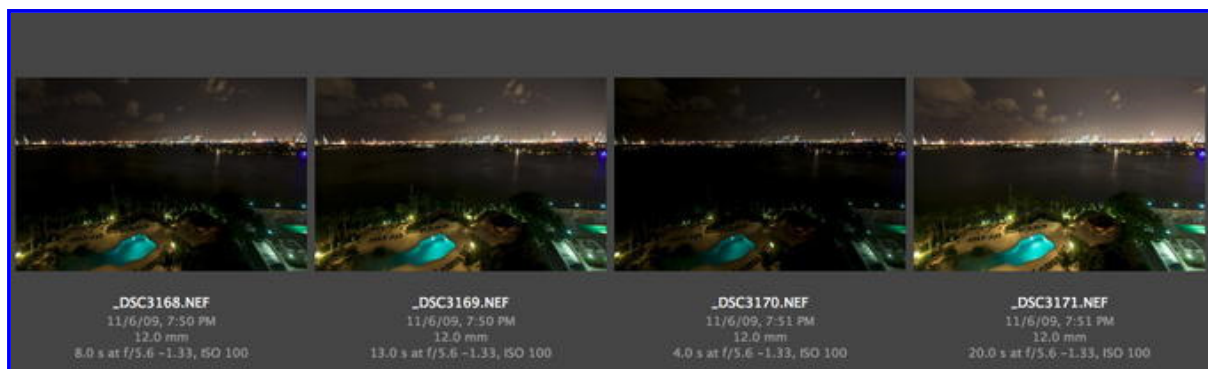
Using a dark-to-light strategy, the first step is to open the darkest exposure, shot at the shortest shutter speed (4 seconds) in Adobe Camera RAW (ACR) by double-clicking the capture in Bridge.

This capture will be used for the bright city lights, so I've upped the Tint and Saturation sliders, as you can see in Figure 3.

Figure 3: The bright skyline needs a shorter exposure than its surroundings but, as you can see in the 4 second exposure this leaves the foreground and water very black.
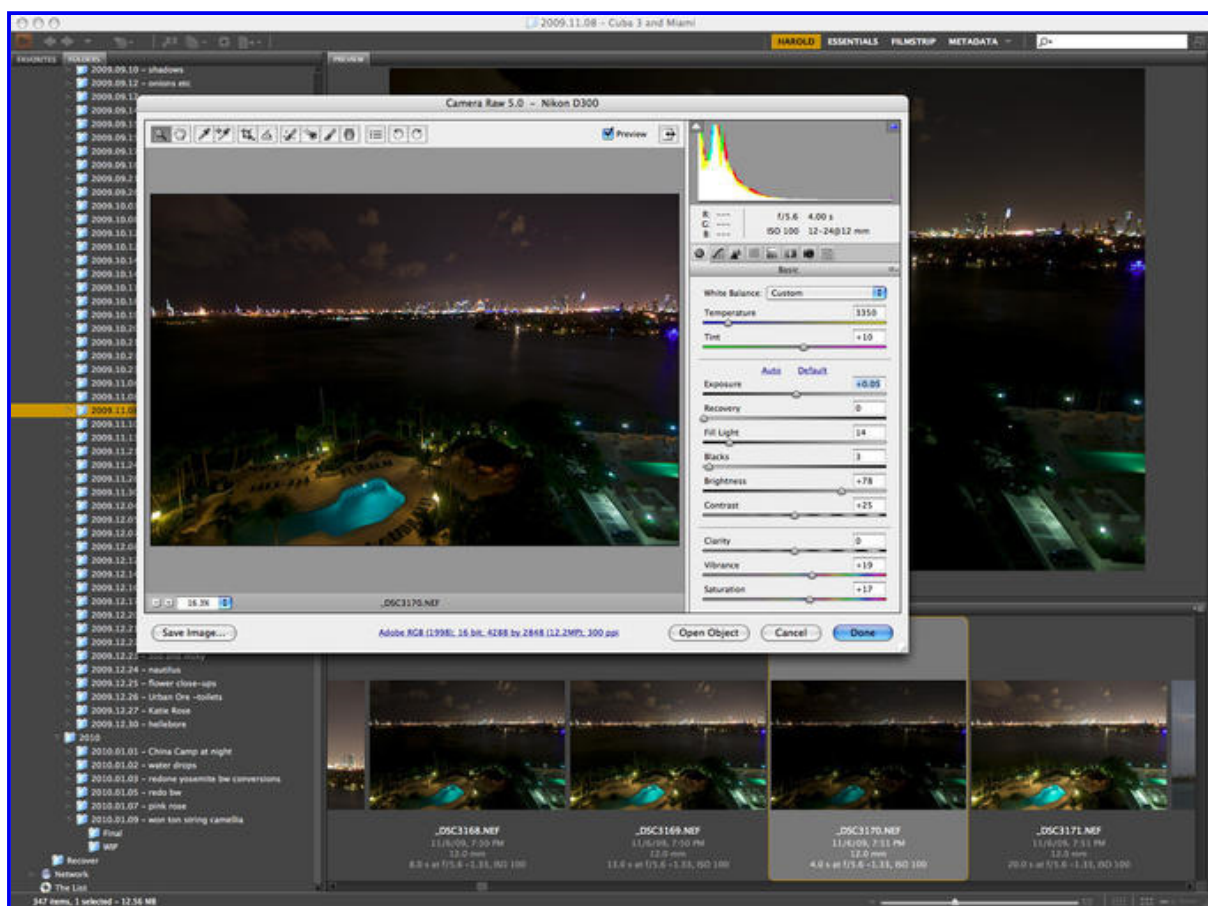
Make sure to hold down the *Alt* key before clicking *Open*; this will open a copy of the RAW file.

Next, it's time to tackle the intermediate areas of the image, this time using the 13 second exposure as shown in Figure 4.

Figure 4: The sky and foreground can are a bit lighter in this 13 second version.
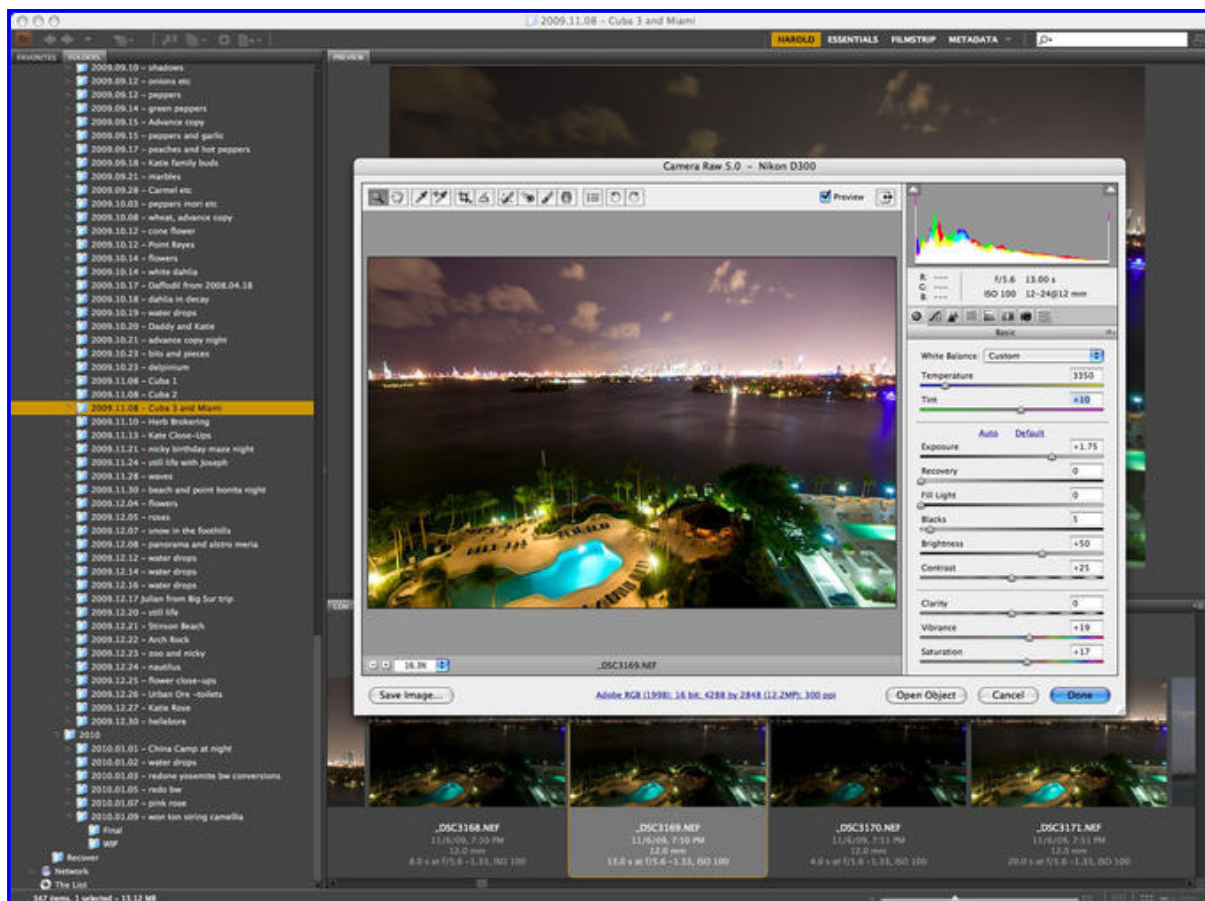
Finally, open the 20 second exposure for the really dark areas in the photo, shown in
Figure 5.

Figure 5: The 20 second version is used to boost the really dark areas of the image.
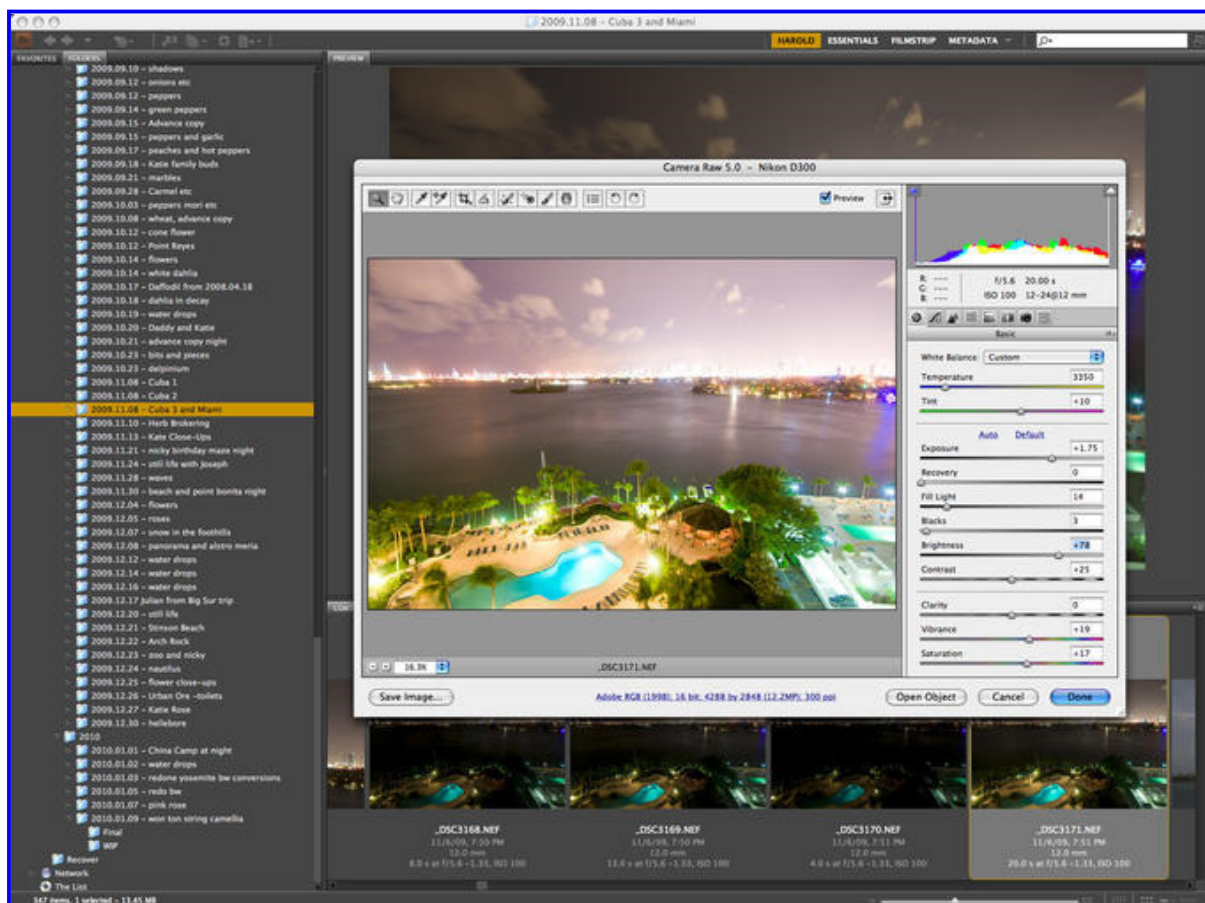
You should now have three versions of the image open in Photoshop. Start with the
darkest (4 second) version. We're going to use this as the background layer, as well as

the layer with the visual information about the Miami Beach skyline.

To create a layer stack with the 13 second lighter exposure on top of the dark background, select the 13 second exposure, hold down the Shift key, and use the Move Tool to drag the 13 second layer over the dark background layer. To keep the layers in alignment, make sure you let go of the mouse (and Move Tool) before you release the Shift key.

Place a black layer mask over the new foreground layer by choosing Layer > Layer Mask > Hide All.

I used a large, soft brush with the color set to white at almost 100% opacity to paint in the foreground areas using the 13 second exposure. You can see a thumbnail of this mask in the Layers Palette shown in Figure 6.

Figure 6: The Layers Palette shows how the layers consisting of different exposures have been combined.
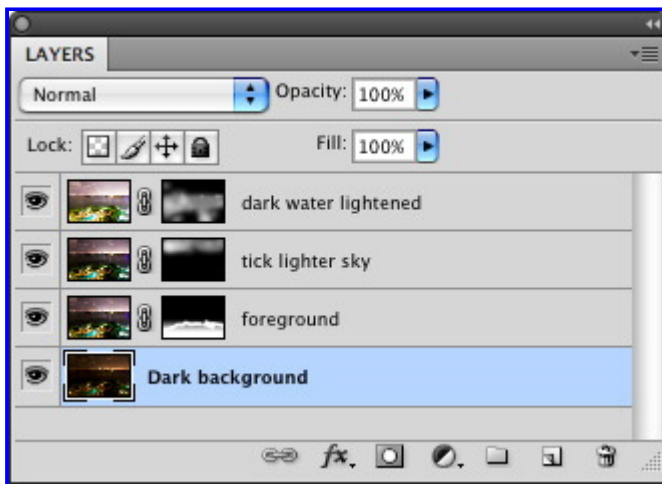

I also used the 13 second exposure in a separate layer to lighten the sky. I used a distinct layer for the sky as opposed to the foreground so that if necessary I could alter the overall layer opacity for the two areas independently. Usually it is a good idea to make one adjustment per layer.

The last, 20 second layer was intended to lighten the dark water. I aligned it on top of the layer stack, added a Hide All layer mask, and "painted" in the dark water area.

You can see thumbnails of all four layers and their associated layer masks in the Layers Palette shown in Figure 6. By the way, when I created this hand HDR stack I ended up never using one of the original exposures, the 8 second version. When I looked at it closely I simply found that it did not add enough information to be useful.

With these layers in place, I archived a copy and merged down the layers using Layer > Flatten Image to create the image shown in Figure 7. My intent in creating this kind of hand HDR image is to extend the dynamic range beyond even what a human could have seen at the time without creating the unnatural effect so typical of automated HDR software.

Figure 7: The finished image shows a surprising dynamic range—greater than that of the human eye looking at the scene.
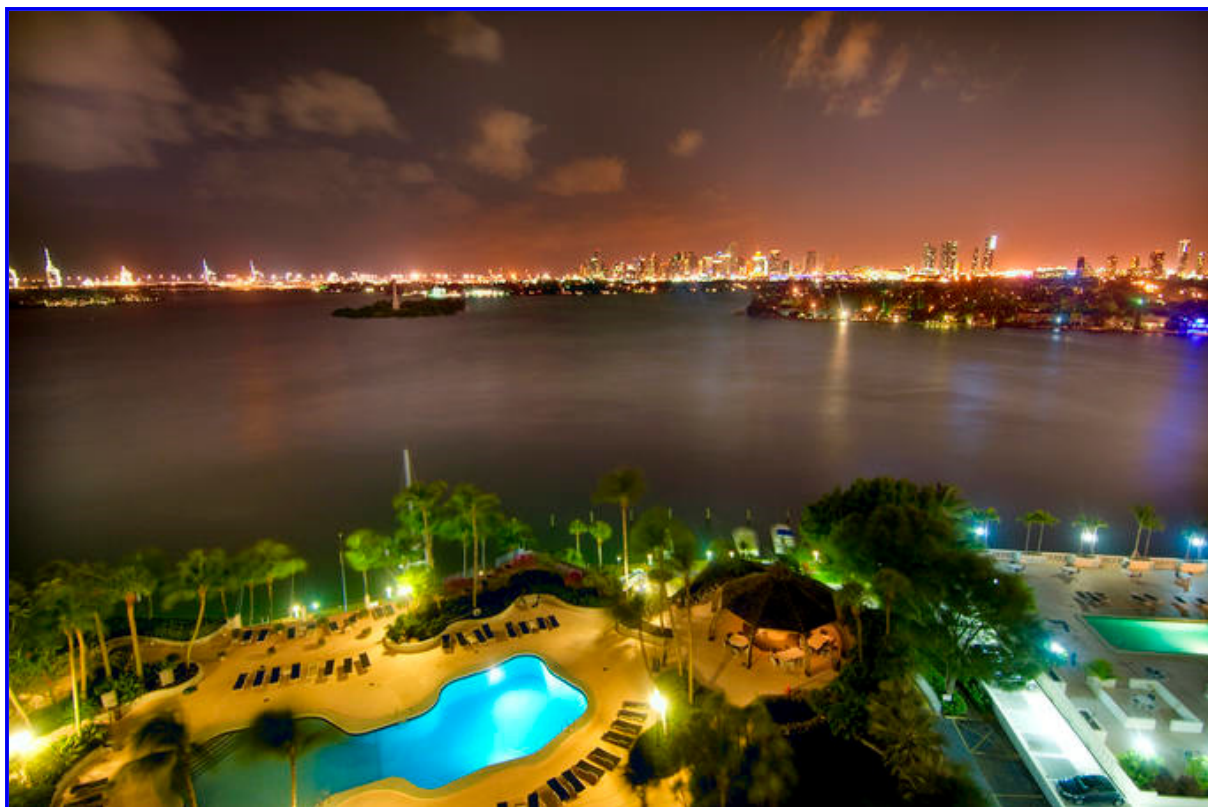
Note that flattening an image is one of the relatively few pixel destructive actions you can take in Photoshop (cropping an image is another). So you should be sure to archive a copy of your image complete with its layers before you flatten it.

Starting in the Middle

When I saw this pink rose at Trader Joe's I knew I had to buy the bouquet, bring it home, and photograph the spiral in the flower.

I used sunlight, with a mirror and white board to light the flower. The five shots shown in Adobe Bridge in Figure 8 were shot at shutter speeds from 1/2 a second to 10 seconds, each exposure at f/36 and ISO 100 using a tripod firmly locked in place to make sure there was no movement between exposures.

Looking at my RAW captures, it was pretty clear to me that the middle version, shot at 2.5 seconds, was quite close to how I ultimately wanted to interpret the image.

Figure 8: I shot the pink rose at five shutter speeds, ranging from half a second to 10 seconds.

Opening the 2.5 second exposure in ACR (Figure 9) I adjusted the White Balance, Tint, Contrast, Vibrance and Saturation sliders.

*Figure 9: The 2.5 second exposure shown in ACR.*
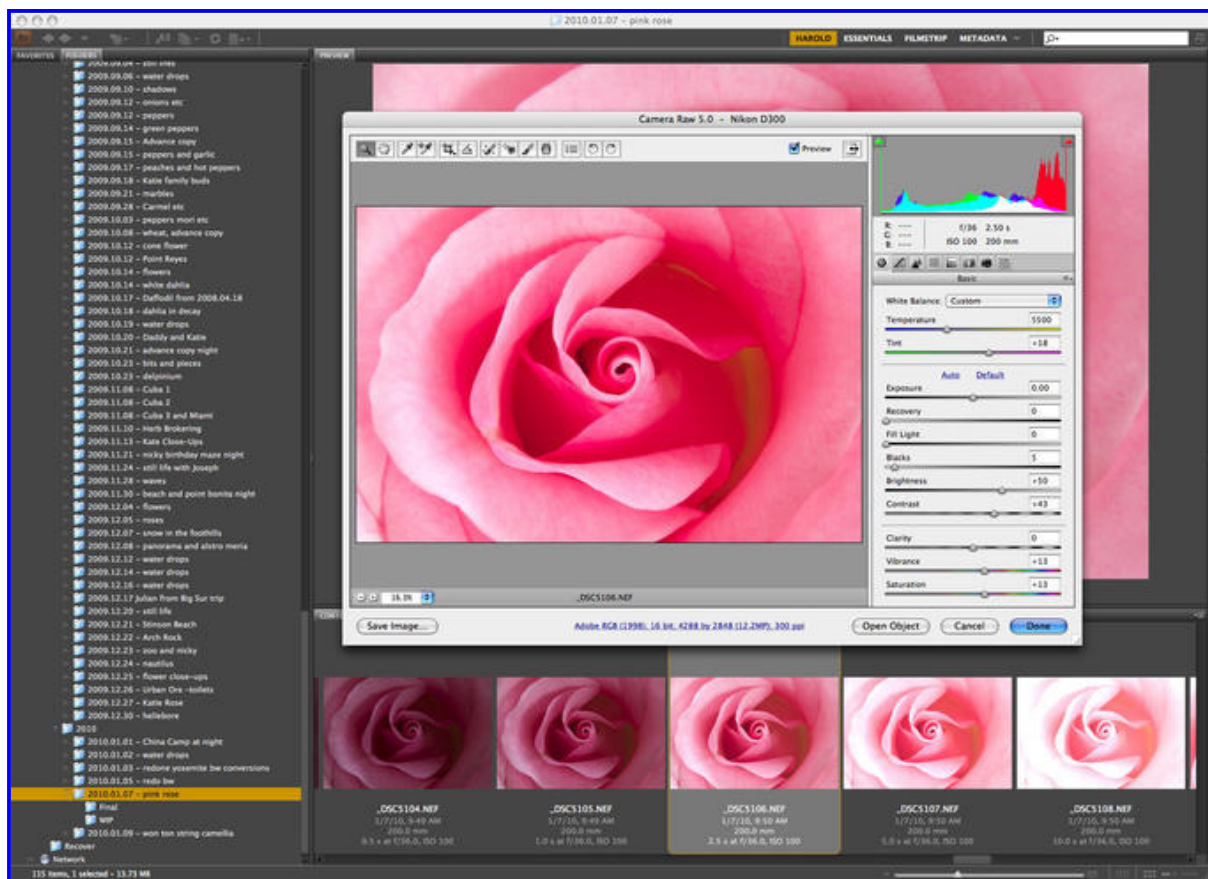
Next, I opened a copy of the 2.5 second exposure with the ACR tweaks in Photoshop. It looked pretty good to me, but I could see that I wanted the right side lighter and the left side darker.

So I opened a lighter capture (10 seconds) and positioned it over the middle capture. You can see in Figure 10 that I used a straight gradient blend on he layer mask to combine the lighter right side with the background layer.

I used a similar technique to add darker colors to the left side, using the ½ second exposure. You can see on the Layer mask that besides the gradient, I used the Brush Tool to paint in some selective darkness.

Note that I took down the overall opacity of each of the layers that I used to tweak the middle exposure, the darker layer to 50% and the lighter layer to 35%. The layer masks already served to reduce the impact of the layers substantially, and the reduction of overall opacity took the impact of the reduction further.

Figure 10: Lighter and darker layers are shown on top of the middle (2.5 second) background exposure in the Photoshop Layers palette.
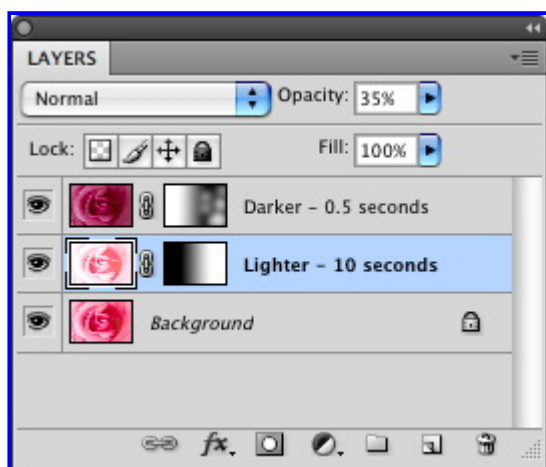
At this point, the image was most of the way towards its final appearance, shown in Figure 11.

Figure 11: The finished pink rose image.
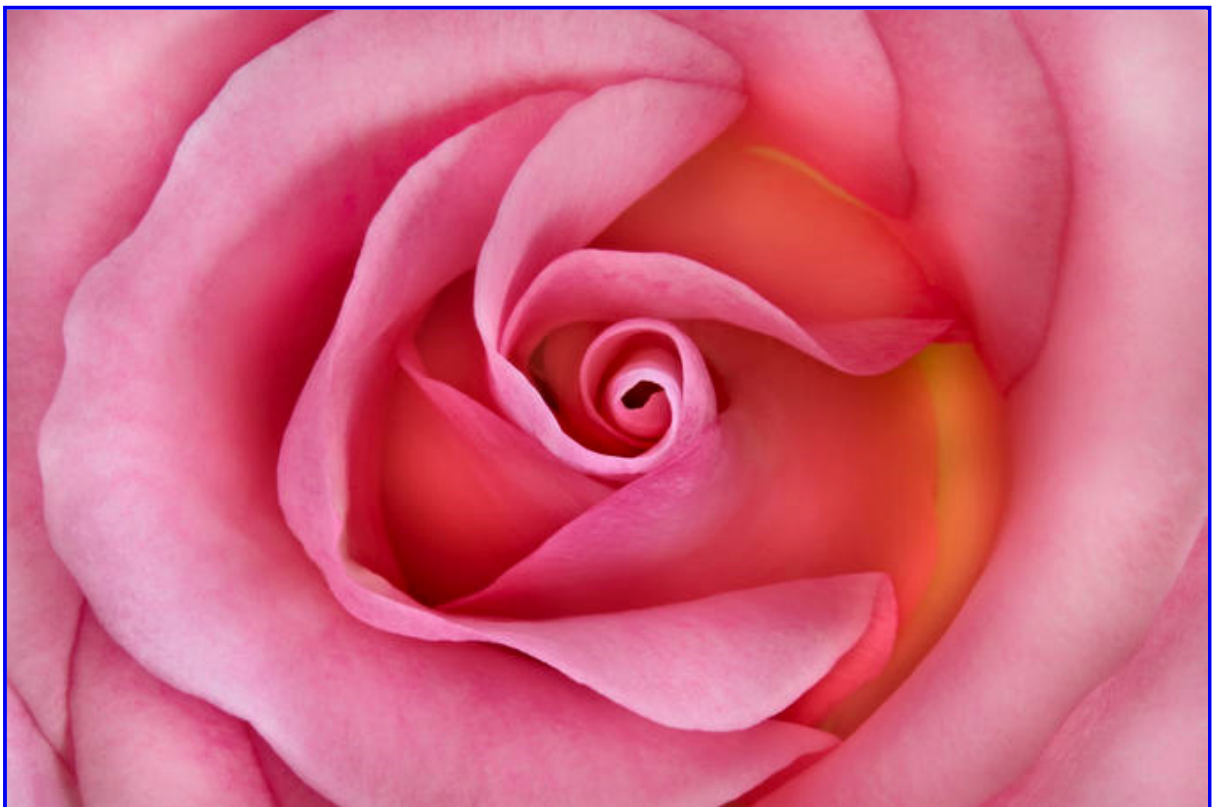

Stacking on Top of HDR

Sometimes the easiest approach is to run your captures shot for HDR through automated software designed to make this process easier, typically [Photomatix](#) or the Merge to HDR feature in Photoshop. See [Creating HDR Images by Hand, Part I](#) for more information about this approach.

What if parts of the resulting image don't look quite right? It's easy to use hand HDR techniques to layer in specific exposures. You can use your automated HDR composite as the background layer and use masks to control the specifics of what you want to show from individual captures.

The Puente Bacunayagua is the longest and tallest bridge in Cuba, built during a highway construction program financed by the Soviets.

Reaching the café that overlooks the bridge shortly before sunset I realized that I had an exposure problem: the canyon crossed by the bridge was in deep shadow. To solve this issue, I planned for by HDR by shooting exposures across a spectrum of values, ranging from a 1/160 of a second exposure for the sky and sunset to a 1/8 of a second exposure for the jungle foliage in the canyon. As you can see in Figure 12, each exposure was shot at f/8. I used a tripod to keep the images in alignment.

Figure 12: Planning for HDR, I shot five exposures ranging from 1/160 of a second (darkest) to 1/8 of a second (lightest).
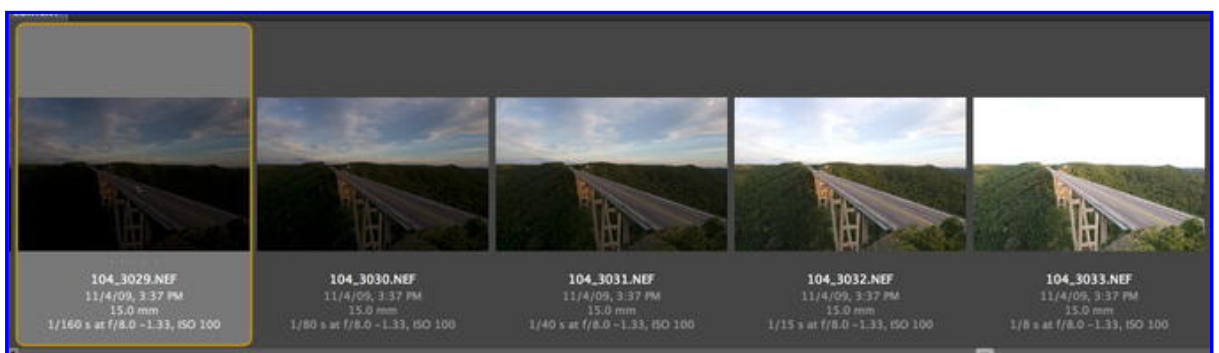
I thought this was a situation that might work well with automated HDR, so I used

Photomatix to generate an HDR composite. Following tone mapping, it looked as shown in Figure 13. (See Creating HDR Images by Hand, Part I for more information about working with Photomatix.)

Figure 13: The Photomatix composite following tone mapping.
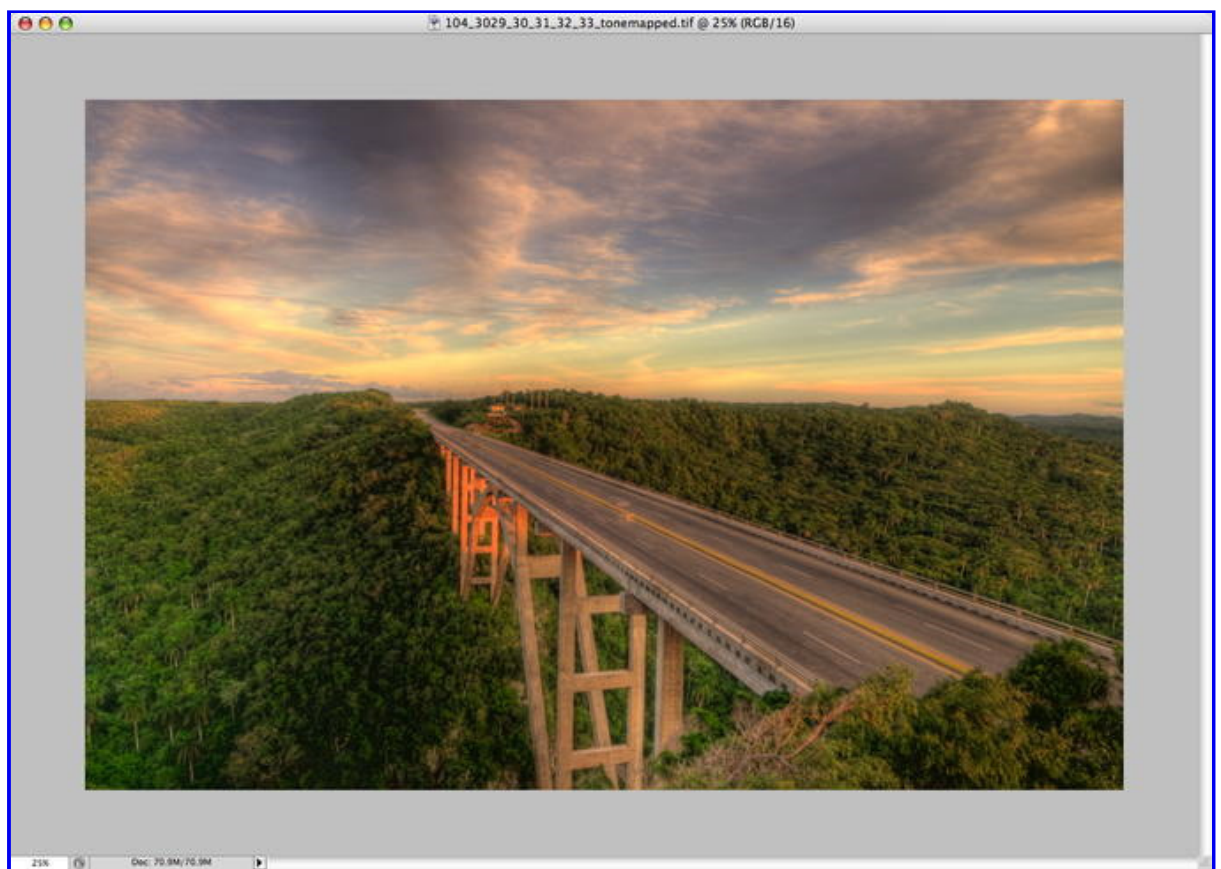
If you look closely at the Photomatix composite shown in Figure 13, you'll see what may be a problem. There's not much traffic on the Cuban highways in the countryside, but there is some. A van coming across the bridge during the first of my captures was averaged out against the other exposures used in the composite, so that it appears ghostlike.

To fix this problem, I opened the capture with the van in ACR and Photoshop. Rendering the van so it was correctly exposed and light enough required pushing the Exposure slider to the right, as shown in Figure 14.

Figure 14: The 1/160 exposure caught the car in motion.
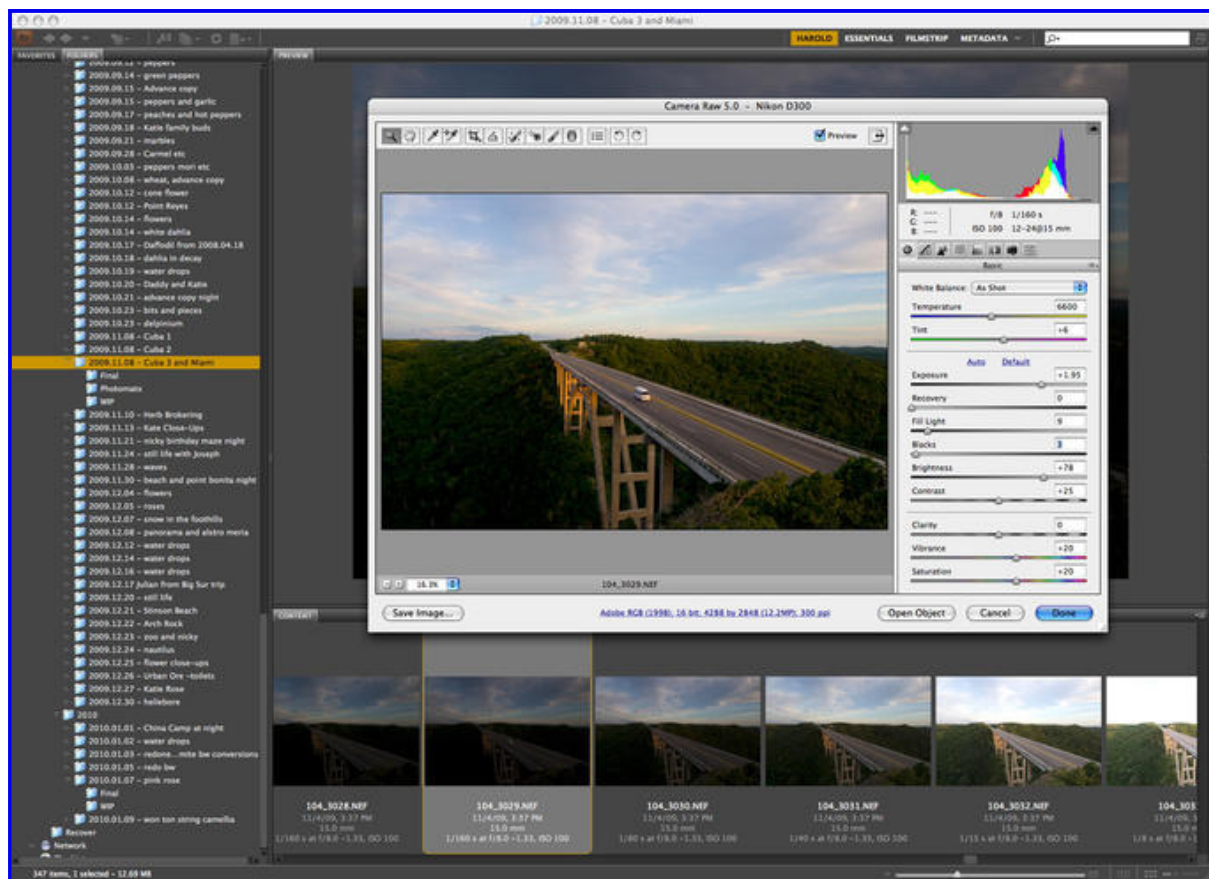
I then pasted the capture with the car on top of the tone-mapped version. I used a Hide All black layer mask to hide the new layer on the stack, then carefully used the Brush Tool to paint in the van, with the results shown in the final version (Figure 15). Note that I could have decided to go the other route, and painted out the vehicle completely. Half in and half out just doesn't work in my opinion.

Figure 15: The finished image of Puente Bacunayagua based on the Photomatic composite with individual captures layered on top.
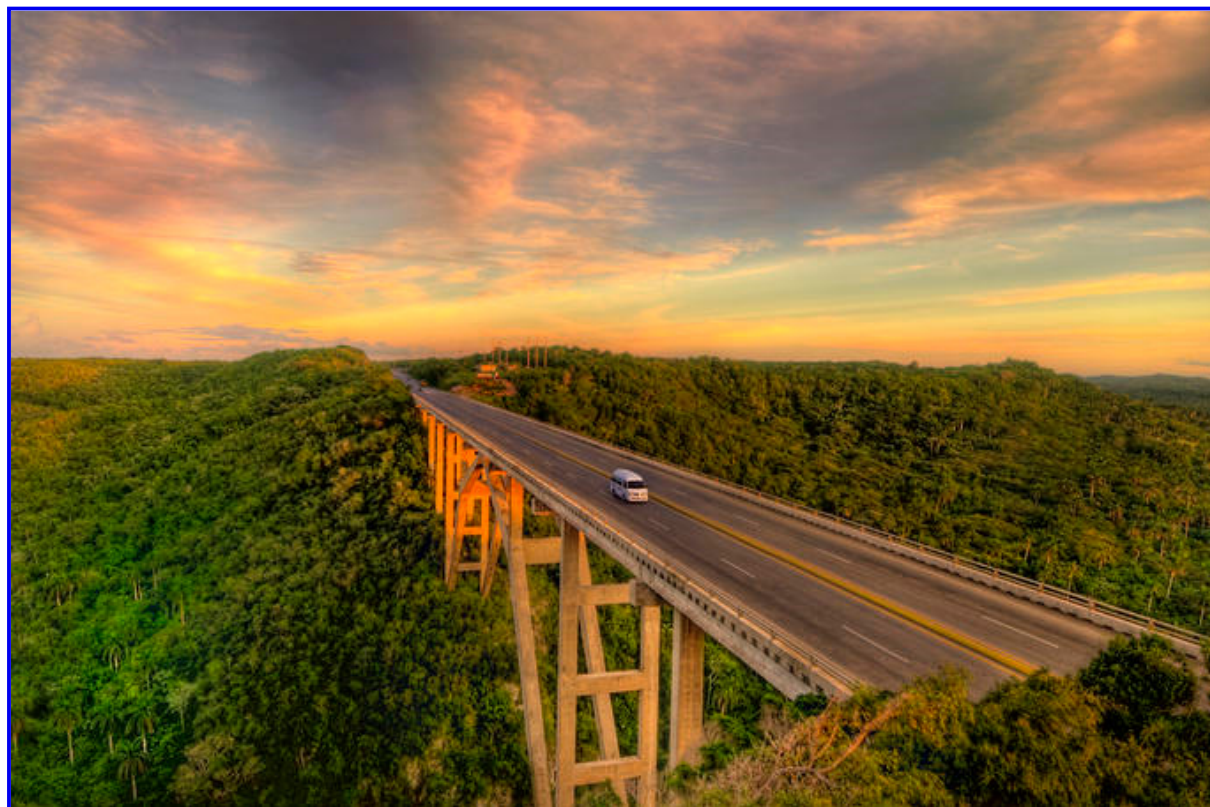
Note that you can use layered versions on top of automated HDR to fix many

problemsâ‍‍not just obvious things like ghost vans.

Conclusion

This article has shown you three common scenarios for extending dynamic range using hand-HDR in Photoshop. If you want to use hand HDR techniques in your own work, you need to shoot with appropriate bracketing and then approach post-processing with a strategy in mind. One of the approaches shown in this article will likely work for many situations; however, there are always exceptions. Be creative, and devise your own approaches for image combinations using layers and masking!

The three approaches shown in this article are:

- Starting with the darkest capture, and layering on lighter versions
- Starting with a middle capture, and tweaking it using light and dark versions
- Starting with an automated HDR blend and adding specific exposures to fix problem areas.

All of these approaches use layers and layer stacks. Some of the techniques used for dealing with stacks of layers are explained in Advanced Photoshop Tutorial: Multi-RAW Processing. You'll also find a detailed step-by-step explanations of these methods in *The Photoshop Darkroom* (Focal Press). A subsequent article in my *Creativity in the Photoshop Darkroom* series will also look at various common layer and layer stack scenarios.

More

- Harold's member page
- Harold's gallery page

About the Author

Harold Davis is a photographer and author. His photographs have been widely published, exhibited, and collected. Many of his fine art photography posters are well known. Harold's images have won a Silver Award in the International Aperture Awards 2008 competition, and inclusion in the 2009 North American Nature Photography Association Expressions Showcase. Harold is the author of *The Photoshop Darkroom: Creative Digital Post-Processing* (Focal), *Creative Composition: Digital Photography Tips & Techniques* (Wiley), *Creative Night: Digital Photography Tips & Techniques* (Wiley), *Creative Close-Ups: Digital Photography Tips & Techniques* (Wiley), *Practical Artistry: Light & Exposure for Digital Photographers* (O'Reilly Digital Media) and other books. Harold gives frequent digital photography workshops, many under the auspices of the Point Reyes National Seashore Association. **More »**

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