AN EXPERT GUIDE TO

Adobe Camera Raw

Think
TAP
Learn

AN EXPERT GUIDE TO
ADOBE CAMERA RAW

INTRODUCTION

The Adobe Camera Raw interface is quite deceptive. Hidden within in are several important tools that are easy to miss. Tag your time and work your way through this guide completely to discover new imaging super powers.

INTRODUCTION

What's so special about raw files? They're totally the secret to getting the best results from every camera. Don;t you want every shadow, highlight, and detail your camera sees? Of course you do!

I continued to be amazed at how many people still don't shoot using a raw file format. Sure, I understand that certain types of shooters insist they need the faster buffer speeds they get when shooting JPEG (though the speeds of most modern cameras make this argument irrelevant for all but a few shooters).

WHAT IS A RAW FILE?

A raw file contains virtually everything that your cameras sensor can see. The data is minimally processed (it may have a white balance preset or picture style flagged, but not applied). While your camera may contain settings for sharpness, exposure, or lighting conditions, the raw file stores that info as modifiable information and captures the original (unmodified) data that came through your cameras sensors. This is very useful because it lets you easily adjust white balance, sharpening, and more in Lightroom.

Each manufacturer treats the format differently, using a proprietary format. Fortunately Adobe frequently updates their raw technology to support the newest cameras on the market.

To find out if you can access a particular camera format from within Adobe software by visiting Adobes web site at http://helpx.adobe.com/photoshop/camera-raw.html.

The original on the right and the Raw file developed on the left. The Upright adjustment was also applied as well as lens correction to remove distortion.

THE NEED TO PROCESS

A raw file is not ready for printing or sharing out of the camera, you'll need to process it with software such as Adobe Camera Raw or Lightroom. This is a good thing as it allows you to precisely decide on issues like exposure, toning, sharpening, and white balance. When you develop images in Lightroom, you are working at a bit depth of 16 bits per channel.

This is an extremely accurate way to represent color. Raw files can be much larger than JPEG files. This extra data is used to hold more image detail, which can reduce, or even eliminate, compression artifacts found in JPEG files. However, that extra data can increase the time it takes for the files to write to the memory card.

WHAT ABOUT DNG?

In 2004 Adobe released the Digital Negative Specification (DNG) file format. The code and specifications were made publicly available so manufacturers could build in support for the format to their products. The goal was to replace several proprietary raw file formats with a universal format. Despite initial optimism, camera manufacturers have been slow to adopt it (some even refusing). At this point, DNG files are a useful way to archive raw files and attach additional metadata.

You can find out more about DNG at http://helpx.adobe.com/photoshop/digital-negative.html.

The use of raw allows for better preservation of subtle color details and a wider range of exposure information.

WHY SHOOT RAW?

Most digital cameras (particularly ones aimed at pros and enthusiasts), offer a much better series of formats, collectively called raw. These raw (or native) formats have several benefits over shooting to JPEG. The images are usually captured at a higher bit rate, which means that the pixels contain more information about the color values in the image. Most raw files have a depth of 10, 12, or even 16 bits per channel instead of the 8 used by JPEG. The raw format also has a greater tonal range. Raw files can show more details in the shadows and

highlights. The files are easier to work with as they offer greater flexibility and control in image adjustments and color correction. The images also have more color information.

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THE BOTTOM LINE

In this day and age… shoot raw. Storage is cheap. Memory cards are cheap. Missing the shot or losing out on details that your camera tosses away with the JPEG are just not worth saving the extra time and money for 99% of all shooters. Your mileage may vary, but if you haven't given shooting raw a try lately, be sure to do so.

CHAPTER 1

ADOBE **CAMERA RAW**

The Camera Raw support in Photoshop is enabled by a plug-in (essentially an application that runs inside Photoshop). With Camera Raw you can import and develop raw files, and then pass them onto Adobe Photoshop. Camera Raw is designed to work with the native files recorded by many cameras.

© Simon Zhu

What's the Raw Extension?

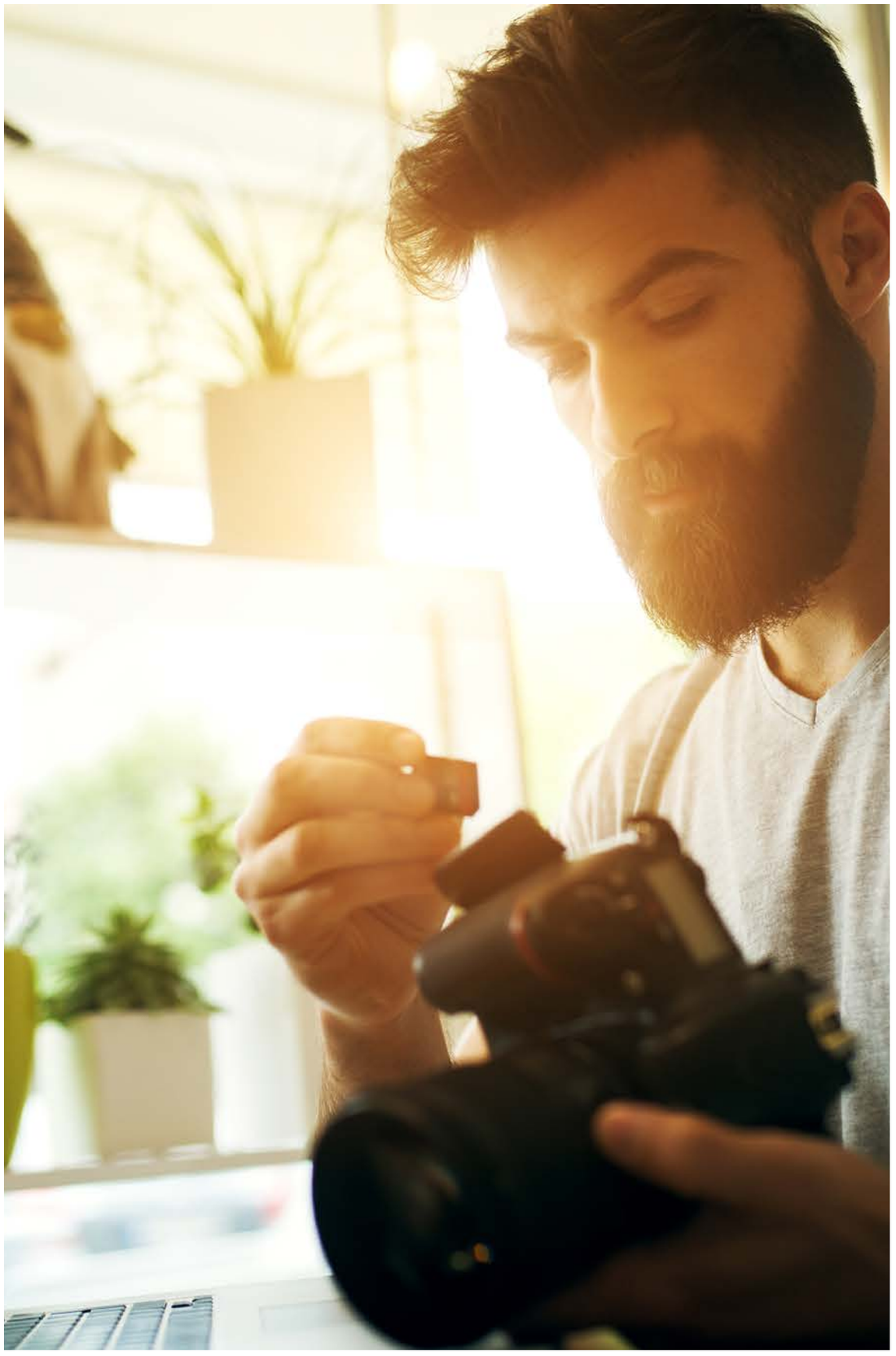
Raw files are not really a file type but rather a description for several manufacturer-specific file formats. You'll find several different file formats in use, and they will vary by camera manufacturer.

SECTION 1

WHAT IS **RAW**?

A raw file is the secret ingredient to a better image. It contains all the data that your camera's sensor could see. For this reason it is a superior start to your digital imaging pipeline.

A Camera Raw file contains unprocessed and uncompressed data, as captured by the digital camera's image sensor. These native files contain much more color and exposure information than a JPEG or TIFF file. The camera also includes metadata, such as white balance, exposure, and more, specifying how that information should be treated.



© dusanpetkovic1

Can I Use Camera Raw?

Not all cameras work with Photoshop Camera Raw (although the list is very long). Adobe keeps updating the plug-in to support new cameras all the time. To keep track of Camera Raw and for a list of supported cameras, visit www.adobe.com/go/learn_ps_cameraraw.

OPENING A RAW FILE

To process a raw file, you'll need to open it with Photoshop Camera Raw. Essentially, you need to develop the file, deciding during the editing stages which information to include. The Camera Raw software interprets the metadata and raw file information to generate a new image.

The good news is that adjustments you make to a raw file are all stored as metadata. The adjustments essentially reprocess the raw file data. The Camera Raw plug-in writes to a sidecar file, which contains youi instructions on how to treat the raw data. In fact, you can have multiple settings for each raw image.

Let's try opening a file:

1. From Photoshop choose **File > Open.**.
2. Navigate to a raw file.
   .You can choose more than one file at a time in order to process with the Camera Raw dialog box. Just hold down the Command (Ctrl) key and select multiple files.
3. Click the **Open** button to open the selected images into the Camera Raw window.
4. Now that you have something to look at, let's take a quick look at the dialog box and its controls.

© Simon Zhu

SECTION 2

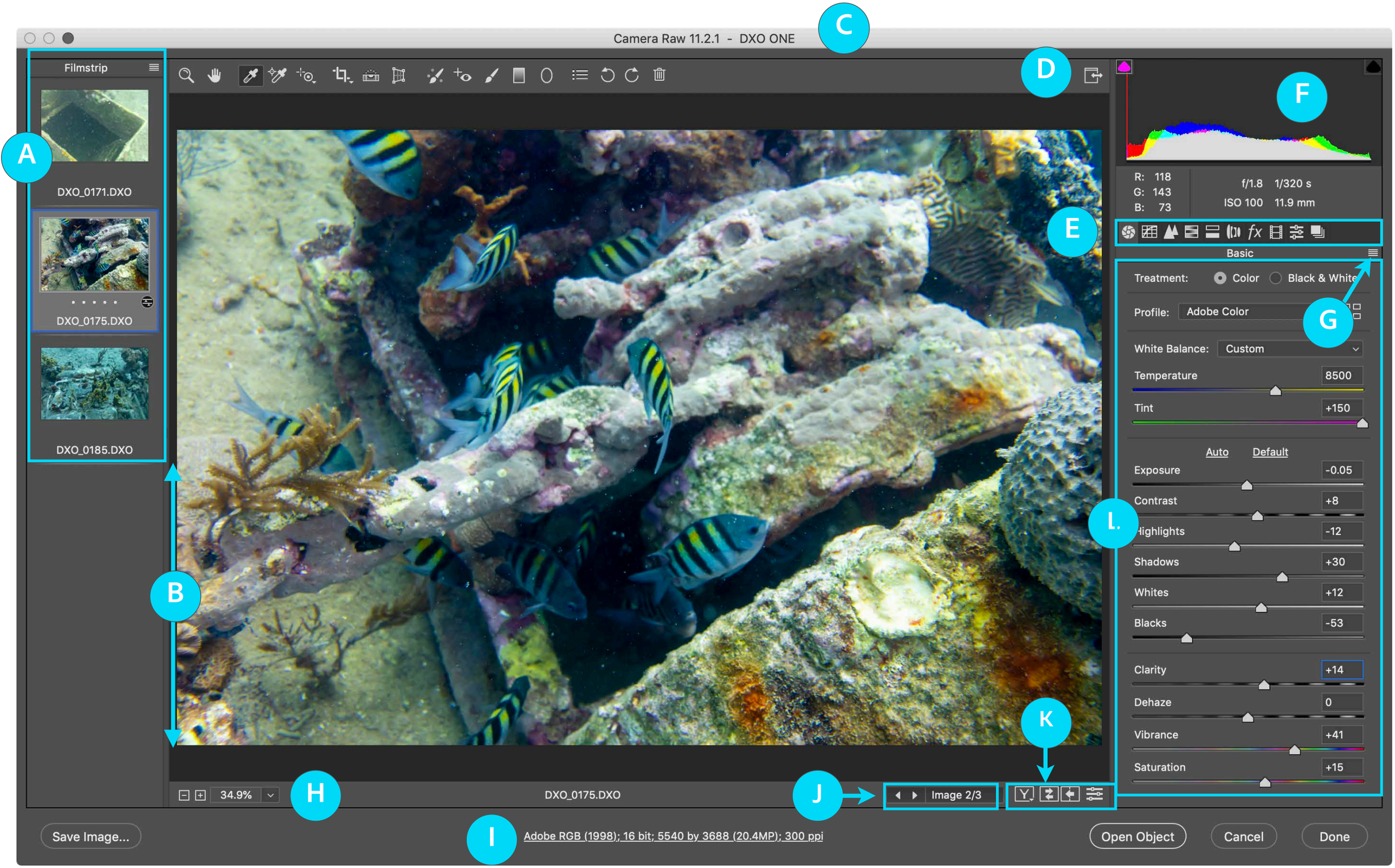
AN OVERVIEW OF THE **CAMERA RAW** DIALOG BOX

At first glance, the Camera Raw dialog box can be a little overwhelming. It's okay to feel this way, because there truly are a lot of sliders and tabs. What you'll find, however, is that the controls are fairly intuitive and very powerful. Here's a quick overview of what you'll find:

© Miha Jan Strehovec

Clipped Warnings

As you make adjustments to the raw image, it's possible to clip data (essentially a loss of detail). In the Histogram display, you'll see two small triangles. You can click the one on the left for shadows and the one on the right for highlights. When enabled, clipped shadows appear in blue, and clipped highlights appear in red. Highlight clipping will warn you if any one of the three RGB channels is clipped (fully saturated with no detail). Shadow clipping will warn you if all three RGB channels are clipped (black with no detail).


Camera Raw 11.2.1 - DXO ONE
C
Filmstrip
A
DXO_0171.DXO
DXO_0175.DXO
DXO_0185.DXO
D
F
R: 118
G: 143
B: 73
f/1.8 1/320 s
ISO 100 11.9 mm
E
Basic
Treatment: Color Black & White
Profile: Adobe Color
G
White Balance: Custom
Temperature 8500
Tint +150
Auto Default
Exposure -0.05
Contrast +8
Highlights -12
Shadows +30
Whites +12
Blacks -53
L.
Clarity +14
Dehaze 0
Vibrance +41
Saturation +15
B
K
34.9%
H
DXO_0175.DXO
J
Image 2/3
I
Adobe RGB (1998); 16 bit; 5540 by 3688 (20.4MP); 300 ppi
Save Image...
Open Object
Cancel
Done

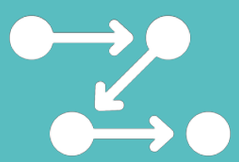
A. **Filmstrip.** If you select more than a single image to open, the images will display here. It is possible to apply star rankings to images in the Filmstrip. You can also synchronize the settings between multiple clips. Just adjust one image, select similar images, and then click the Synchronize button.

B. **Toggle Filmstrip.** If you don't want to see the Filmstrip, just double-click the bar. You can also drag to resize the preview thumbnails.

C. **Camera name or file format.** The camera name and model appears at the top of the window so you know more about the file.

D. **Toggle full-screen mode.** It is possible to maximize the Camera Raw window to see more details and a larger interface. Click to toggle between the larger and default view.

E. **Image adjustment tabs.** There are ten tabs in total for controlling the development of Camera Raw files. More on these in the next section.



Go Big

One of the major benefits of shoot-ing raw is an increased bit depth. Be sure to click the Workflow Options link and set Camera Raw to develop 16-bit files. In the Work-flow Options dialog box, you can also choose Open in Photoshop as Smart Objects.

F. **Histogram.** The Histogram displays the tonal range of the developing image. The left edge shows the shadows, whereas the right shows the highlights. The histogram is interactive in that you can click and drag its sections to adjust the exposure of the image.

G. **Camera Raw Settings menu.** Click this submenu to access controls for saving and loading custom settings as well as resetting the default settings..

H. **Zoom levels.** You can adjust the magnification level of the image. The most accurate view is 100%, but you'll likely choose to zoom out to see the entire image in full.

I. **Workflow options.** You can specify how images will be saved from Camera Raw and how they will be opened in Photoshop. Clicking the blue hyperlinked text lets you choose a color mode, bit depth, file size, and resolution.

J. **Navigation arrows.** Let you switch between multiple images. These work well if the Filmstrip is hidden.

K. **Comparison views.** Compare the original image to the edited image with multiple view options.

L. **Adjustment sliders.** For each adjustment tab, you'll find a set of sliders. These controls are essential for developing the image.

THE RAW TOOLBAR

Across the Camera Raw window is its own toolbar. You'll see several similarities to the Photoshop tools you're already familiar with:

A. Zoom tool (Z). You can click on an image to zoom into an area. You can also click and drag to make a selection for zooming.

B. Hand tool (H). When zoomed, you can use the Hand tool to pan across an image. Hold down the spacebar to temporarily switch to the Hand tool.

C. White Balance tool (I). You can override the white balance settings written by the camera. Just click to select the tool, and then click on an area of the image that should be white, gray, or black.

D. Color Sampler tool (S). You can add up to eight sample points. These are useful ways to track changes in color as you make adjustments to an image. Many users will place a sampler on a white and black area of an image to track any shifts in color.

E. Targeted Adjustment tool (T). There are five different tools to choose from. Click and hold to select specific tools.

F. Crop tool (C). You can crop freely or select from several preset aspect ratios. Remember that any adjustments you make are nondestructive. The cropping will be applied when the image is opened.

G. Straighten tool (A). If your photo is crooked, just select the Straighten tool. Click and drag with the Straighten tool in the preview image to establish a horizontal or vertical angle.

H. Transform tool (Shift+T). Easily fix perspective issues with the powerful Upright adjustment commands. Or manually tilt or rotate your image to address unwanted visual issues.

I. Spot Removal tool (B). The Spot Removal tool lets you heal or clone imperfections in the raw file. The most typical problem you'll need to tackle is sensor or lens dust.

J. Red Eye Removal tool (E). If an image has red eye, select this tool and click on the center of the pupil.

K. Adjustments Brush (K). This powerful tool lets you brush in localized color and exposure adjustments. Click and brush over an area to define it, and then adjust settings with the Adjustment sliders.

L. Graduated Filter (G). This tool is similar to the Adjustments Brush except it allows you to create a transitioned adjustment gradually between two points. This is most typically used to fix areas like a sky.

M. Radial Filter (J). This tool is similar to Graduated filter except it draws its shape as an ellipse or circle. Be sure to choose whether the adjustment applies inside or outside the shape.

N. Open Preferences dialog box (Command+K or Ctrl+K) There are several important choices here including auto-toning, the handling of non-raw files, and GPU acceleration

O. Rotate Image Left (L). Rotates the image 90˚ counterclockwise.

P. Rotate Image Right (R). Rotates the image 90˚ clockwise.

Q. Toggle Mark for Delete. Allows you to flag an image for deletion.

Targeted Adjustment Tool

This tool is an absolute dream to use and it will significantly speed up your editing workflow. You can just click and drag right on the image to make a quick change.

- **Parametric Curve:** Adjust the tone of your image by simply dragging up to lighten or down to darken the targeted area.
- **Hue:** Drag left or right to shift the hue of the targeted area.
- **Saturation:** Drag up to increase or down to decrease the saturation for the targeted area.
- **Luminance:** Drag up to lighten or down to darken the the targeted area.
- **Black & White Mix:** This tool only works if you choose the Black and White treatment option in the Basic tab. It is used to create a custom black and white conversion.

SECTION 3

KEYBOARD **SHORTCUTS**

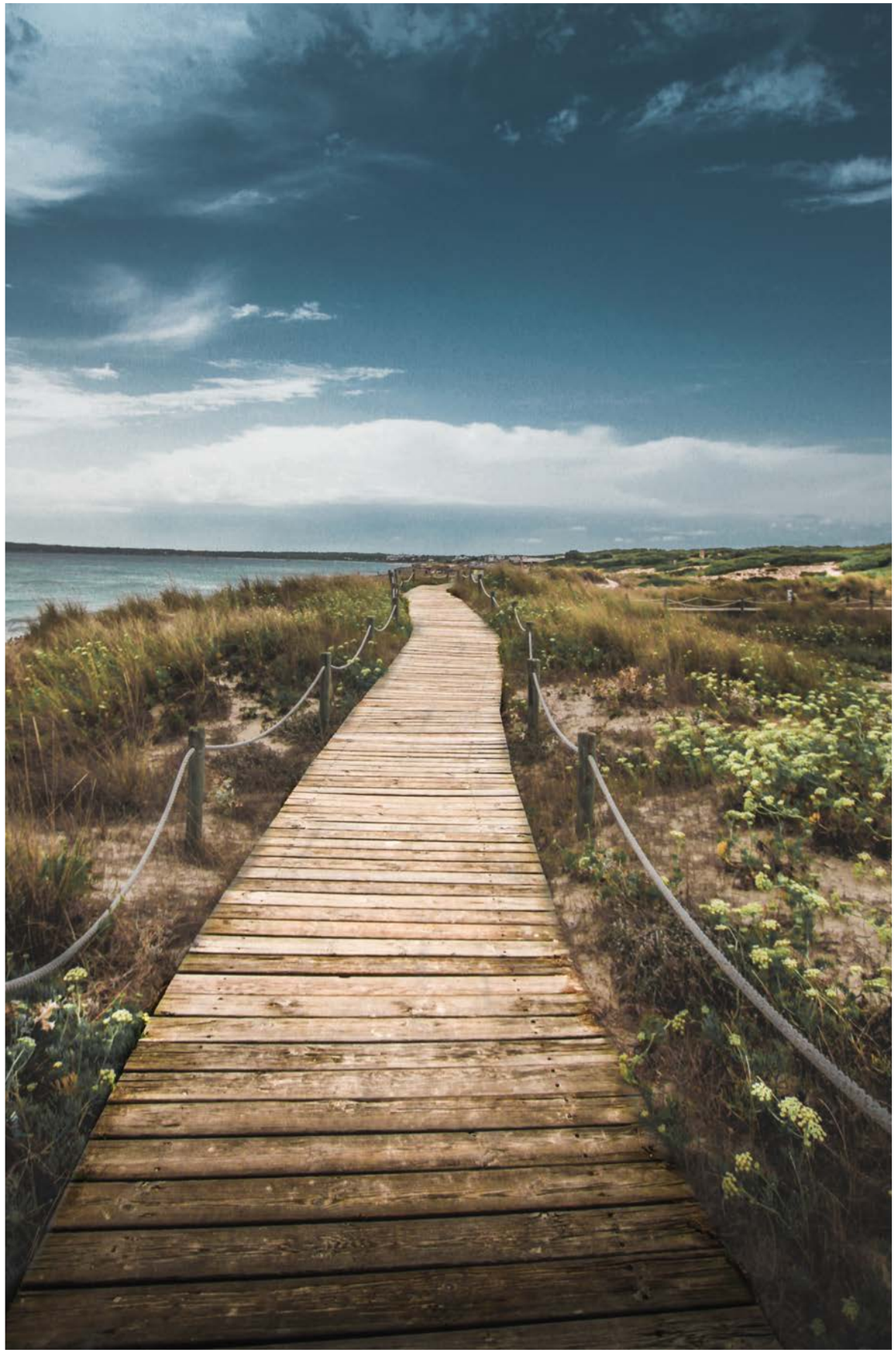
Result	Windows	macOS
White balance	I	I
Zoom	Z	Z
Hand	H	H
Crop	C	C
Straighten/Align	A	A
Sampler	S	S
Targeted Adjustment	T	T
Spot/Retouch	B	B

Result	Windows	macOS
Red Eye	E	E
Delete object or mask	Backspace	Delete
Adjustment Brush	K	K
Gradient	G	G
Reverse gradient	X	X
Radial Filter	J	J
Transform Tool	Shift + T	Shift + T
Toggle Transform loupe	Shift + L	Shift + L
Radial Filter brush	Shift + K	Shift + K
Commit current mask and create a new mask	N	N
Create new preset	Control + Shift + P	Command + Shift + P
Create new snapshot	Control + Shift + S	Command + Shift + S

CHAPTER 2

MASTERING **IMAGE** ADJUSTMENTS

The Camera Raw dialog box offers ten tabs to process your raw files. The tabs are organized by task. Normally, you'll use only some of the tabs to adjust each image. For learning purposes, let's take a look at each.



© Miguel Bruna

CAMERA RAW IMAGE ADJUSTMENT TABS

- **Basic**
  Adjust white balance, color saturation, and tonality.

- **Tone Curve**
  Fine-tune tonality using a Parametric curve and a Point curve.

- **Detail**:
  Sharpen images and reduce noise.

- **HSL / Grayscale**
  Fine-tune colors using Hue, Saturation, and Luminance adjustments.

- **Split Toning**
  Color monochrome images or create special effects with color images.

- **Lens Corrections**
  Compensate for chromatic aberration, geometric distortions, and vignetting caused by the camera lens.

- **Effects**
  Simulate film grain or apply a post-crop vignette.

- **Camera Calibration**
  Apply camera profiles to raw images to correct color casts and adjust non-neutral colors to compensate for the behavior of a camera's image sensor.

- **Presets**
  Save and apply sets of image adjustments as presets.

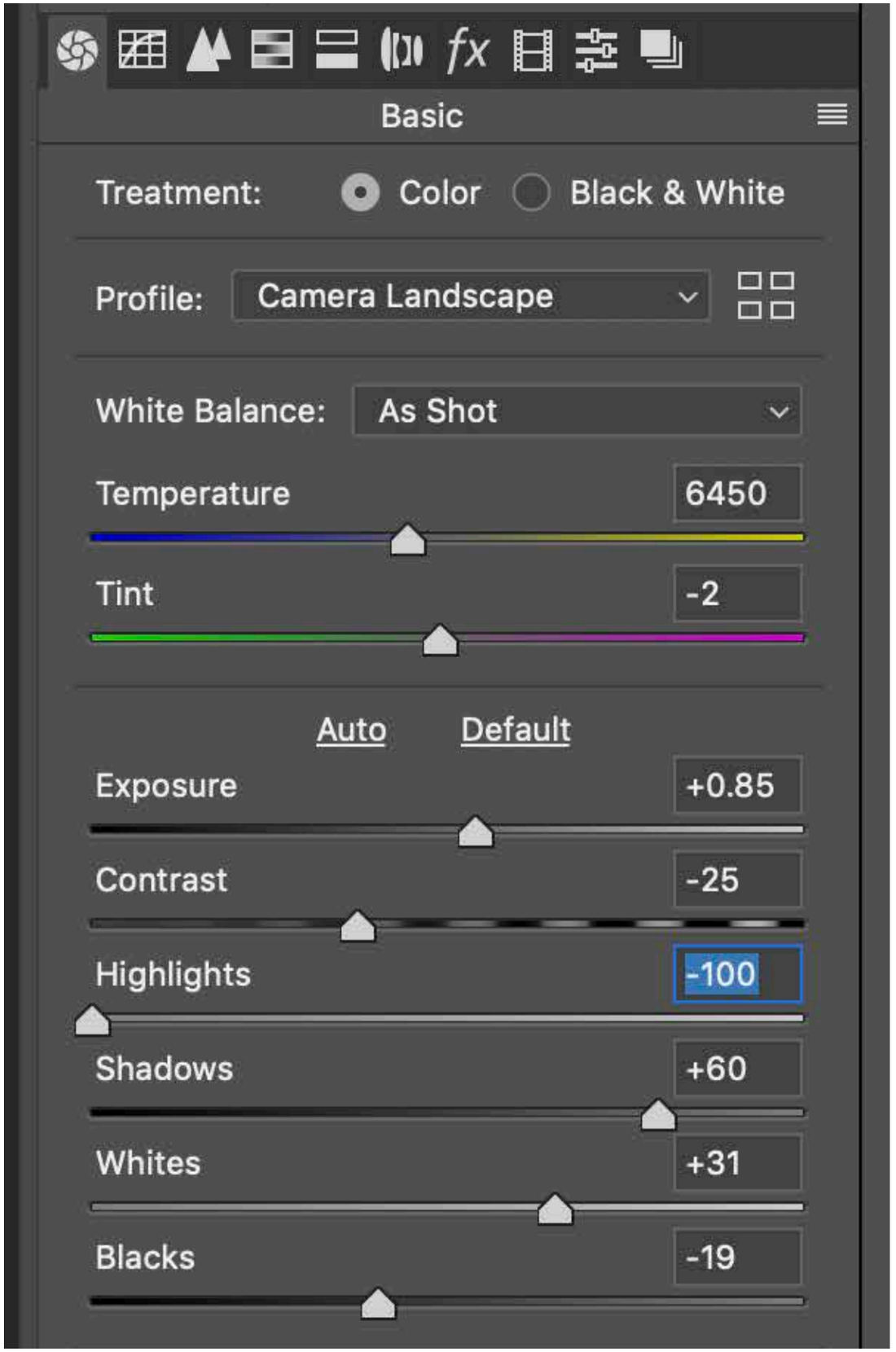
- **Snapshots**
  Create versions of a photo that record its state at any point during the editing process.

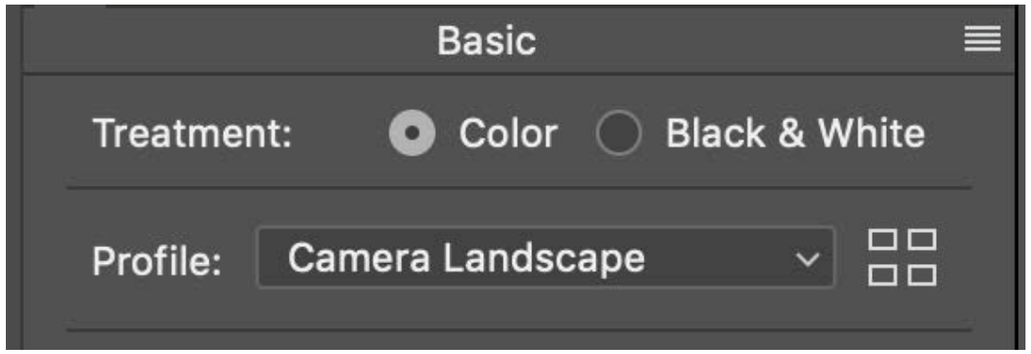
SECTION 1

BASIC

The **Basic** tab lets you make primary adjustments to white balance, color saturation, and tonality. These are the most important controls and the ones you're most likely to change.

It is here that you can take control over key elements like exposure and color. These adjustments will apply to the image as a whole. Don't worry if you can't achieve all the results here, the use of the HSL tab and the Graduated and Radial filters can also help refine your image.

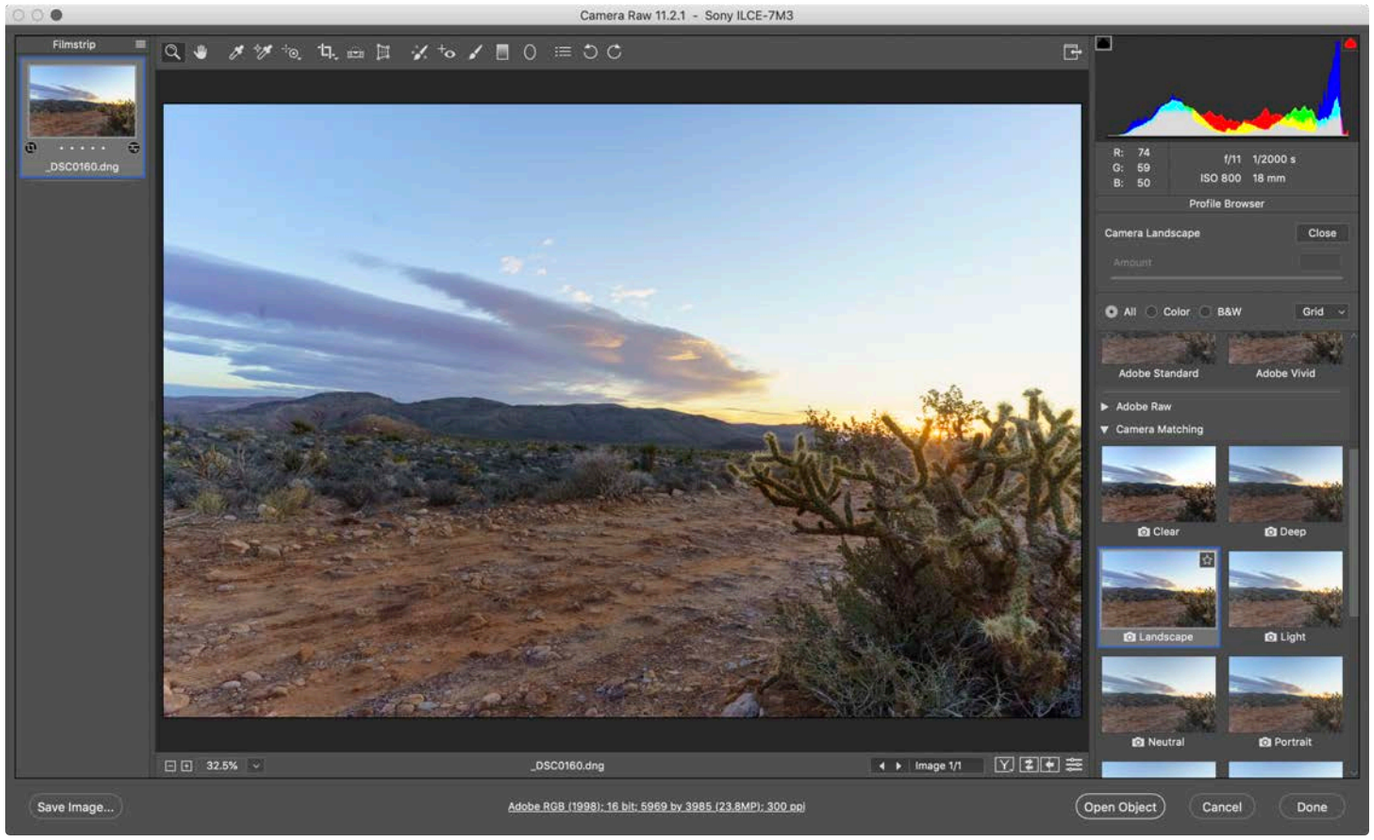




RAW PROFILES

Near the top of the Basic tab is a button to open the **Profiles Browser.** This is makes it easy to access DNG Camera Profiles (DCPs). These can simulate the traditional in-camera recipes used to process JPEG files by each camera manufacturer. They can also unlock creative profiles for new looks.

1. Click the four square icon to open up the **Profile Browser**.
2. Choose a **DNG Camera Profile**
   - **Adobe Raw**
   - **Camera Matching**
   - **Creative**
3. Adjust the **Amount** slider if using a Creative profile.
4. Click Close to return to the Basic tab for further edits.



WHITE BALANCE

There are three major controls for affecting the white balance of your image.. When set properly, the white balance ensures that your image shows no color casts.

- **White Balance:** This pop-up lists offers several presets that are similar to those offered by your camera. Each is well-suited for different lighting conditions.
  - Presets include **Daylight**, **Cloudy**, **Shade**, **Tungsten**, **Fluorescent**, and **Flash**.
  - Choose **As Shot** to restore what your camera captured.
  - Use **Auto** to analyze the image and calculate a new value.
- **Temperature:** This adjustment effectively warms or cools the shot to compensate for the color temperature.
  - **Decrease Temperature** to correct a photo taken with a lower color temperature of light/
  - **Increase Temperature to** correct a photo taken with a higher color temperature of light; the image colors become warmer (yellowish) to compensate.
- **Tint:** This control compensates for green color casts for photos made under fluorescent light.

TONE CONTROLS

The next controls are useful for refining the exposure or tone of an image. You can click **Auto** to have Camera Raw analyze the image and make adjustments. Click **Default** to restore the default settings (zero values).

- **Exposure:** Adjusts the overall image brightness. Exposure values are in increments equivalent to aperture values (f-stops) on a camera.
- **Contrast:** This adjustment mainly affects the midtones. When you increase contrast, the middle-to-dark image areas become darker, and the middle-to-light image areas become lighter.
- **Highlights**: This affects the brighter areas of a photo. Drag to the left to darken highlights and recover "blown out" details. Drag to the right to brighten the highlights while minimizing image clipping.
- **Shadows:** This affects the darker areas of a photo Drag to the left to darken shadows while minimizing clipping. Drag to the right to brighten shadows and recover lost details.
- **Whites:** This affects the white point of an image and where it clips. Drag to the right to increase highlight clipping. or to the left to decrease.
- **Blacks:** This affects the black point of an image. Drag to the left to increase black clipping (to push more shadows to a pure black). Drag to the right to reduce shadow clipping.

DEPTH & COLOR CONTROLS

The next four controls allow you to enhance the amount of color in an image as well as to selectively enhance contrast in areas that lack it most. These sliders are quite useful, but should be used cautiously to avoid an over-processed image.

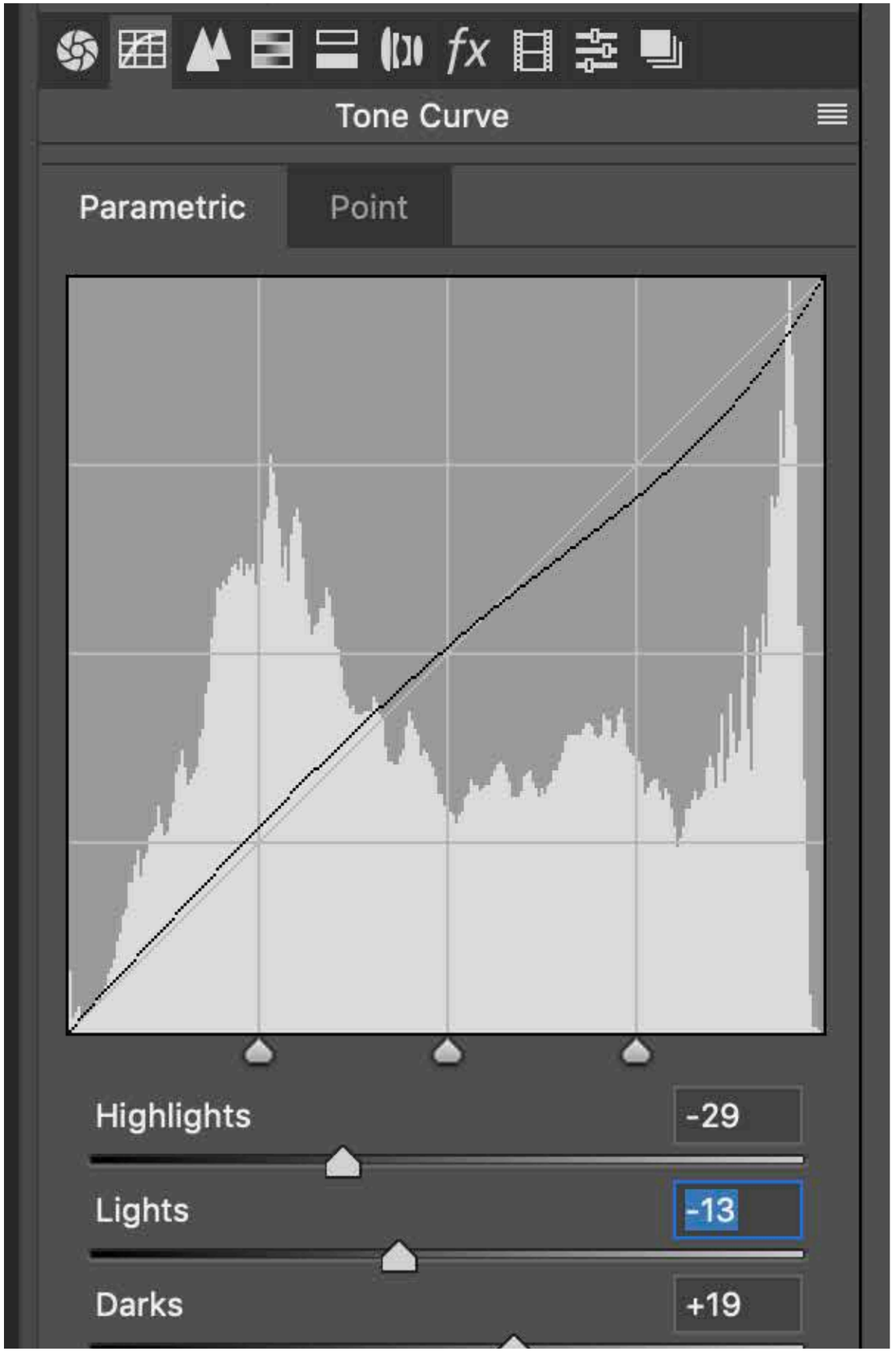
- **Texture**: Adds or subtracts fine detail.
- **Clarity:** Adds depth to an image by increasing local contrast. It has the most impact on the midtones of an image. Be sure to zoom to 100% to best view the effect. Be careful as higher values can introduce a halo along the edges.
  - Double-click the **Zoom** tool to switch to 100% magnification.
- **Dehaze**: This useful adjustment can help restore light that was lost due to atmospheric haze. Be sure to properly set the White Balance for the image before using this control.
- **Vibrance:** This adjustment targets areas that have a lower saturation. It is useful to enhance saturation without color clipping. Vibrance also prevents skin tones from becoming oversaturated.
- **Saturation:** This affects the overall saturation of image colors equally. It ranges from -100 (monochrome) to +100 (double the saturation).

SECTION 2

TONE **CURVE**

With the **Tone Curve** tab, you can fine-tune tonality in an image with controls similar to Photoshop's Curves adjustment. You can choose to use either a Parametric curve or a Point curve.

Each curve offers a different way to enhance contrast and definition. They can be used individually or combined based on your preference.



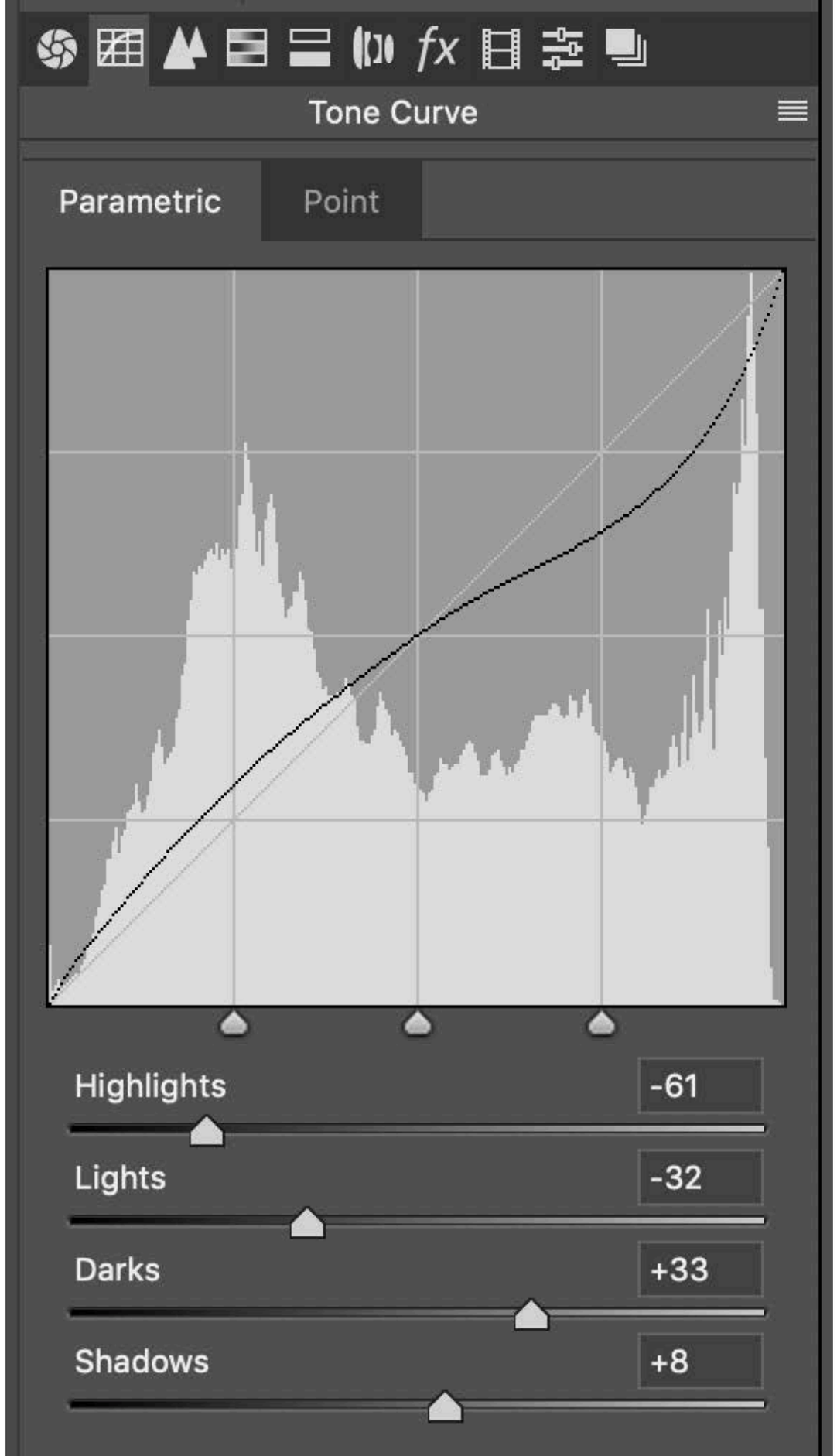
PARAMETRIC CURVE

When you view the graph in the Tone Curve panel, you can see the tonal scale of a photo. The horizontal axis represents the original tone values or input values. The blacks are on the left with progressively lighter values toward the right.

With the **Parametric Curve**, you can drag any of the four Region sliders left or right to affect those areas in the image. As you drag, the curve moves within the affected region.

- **Highlights**
- **Lights**
- **Darks**
- **Shadows**

If you want to redefine these regions, just drag the split controls at the bottom of the tone curve graph.



POINT CURVE

The **Point Curve** can be used to target the overall image or to adjust a color channel independently. This is a useful way to remove stubborn color casts or to boost a color for stylistic reasons.

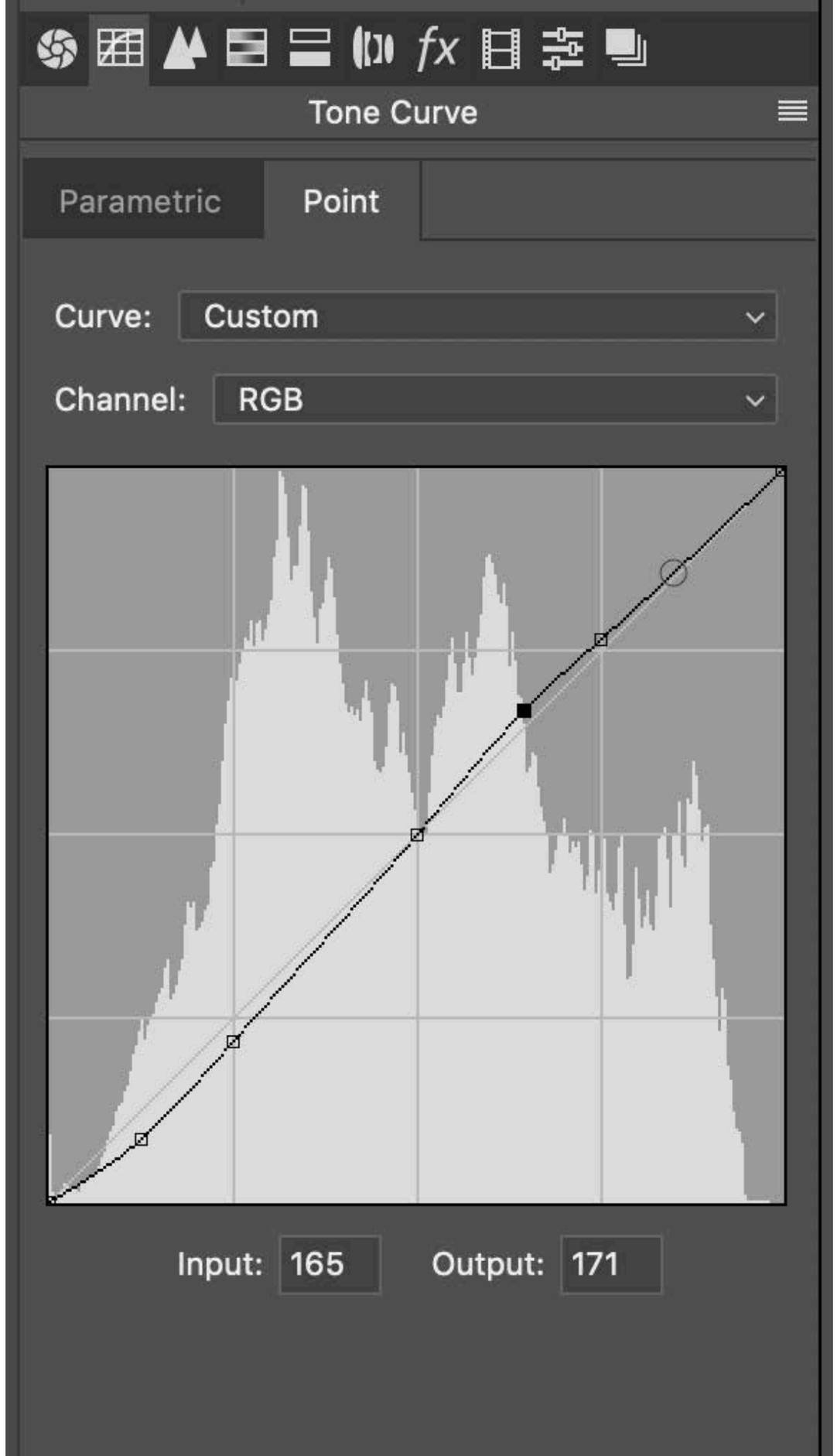
- Click on the curve and or down. As you drag, the Curve changes and you'll see the numbers update in the **Input** and **Output** fields.

- Choose an option from the **Curve** menu to apply a default Curve to enhance contrast.
  - **Linear**
  - **Medium Contrast**
  - **Strong Contrast**

- Drag an exiting point on the Curve to affect contrast. Drag up to lighten an area and drag down to darken.

- Click on the Curve to add a control point.

- Ctrl-click (Windows) or Command-click (macOS) within the image to add a control point that matches the tonal range for where you clicked.

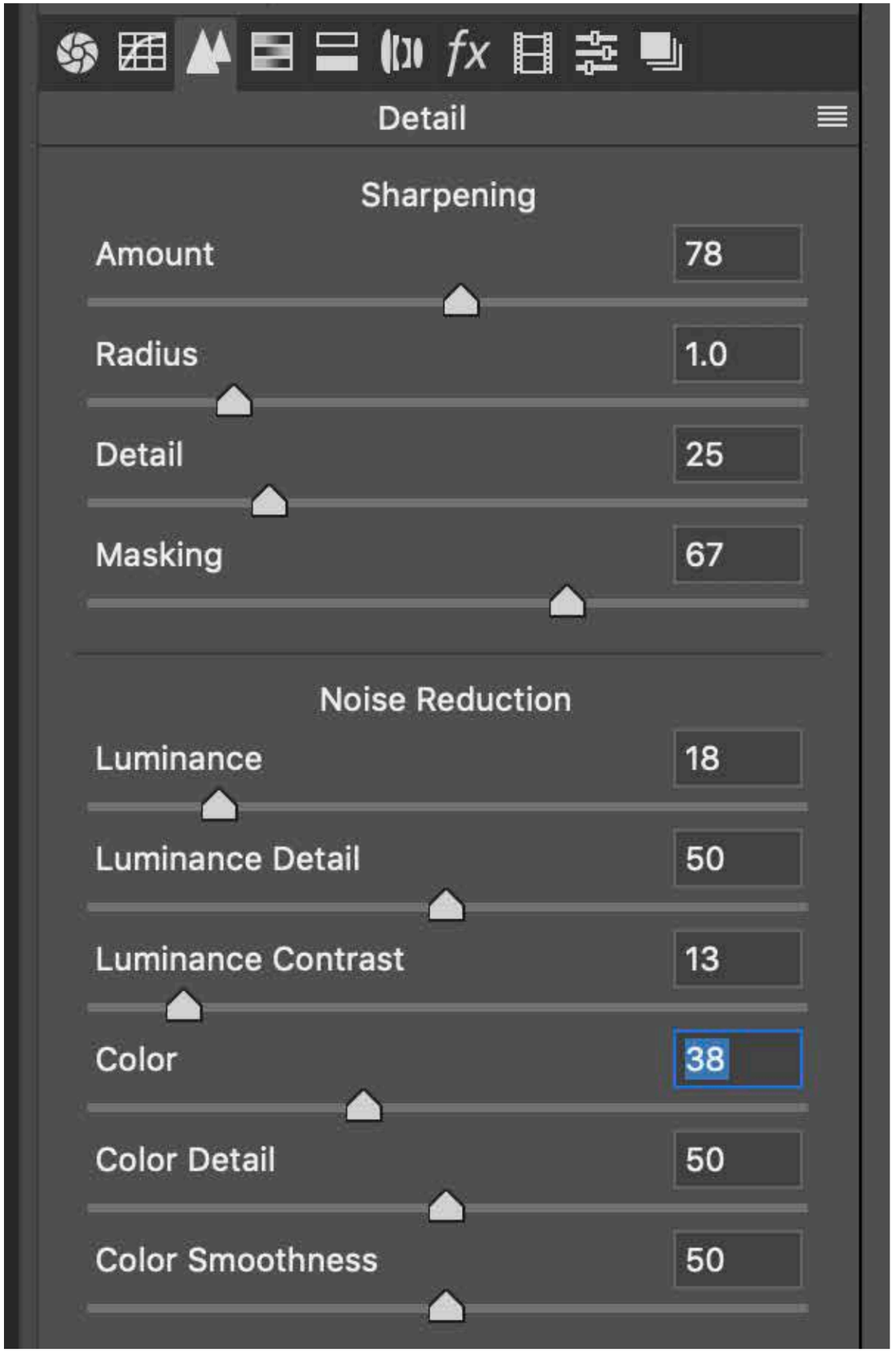


SECTION 3

DETAIL

The **Detail** tab offers precise control over both sharpening an image as well as reducing noise. All raw images will need some sharpening. Noise, on the other hand, may not appear unless the image was shot with a high ISO setting especially under low light.

To best see detail, double-click the **Zoom** tool to switch to 100% magnification. Now it's easier to accurately judge both sharpening and noise reduction at a 100% magnification. .

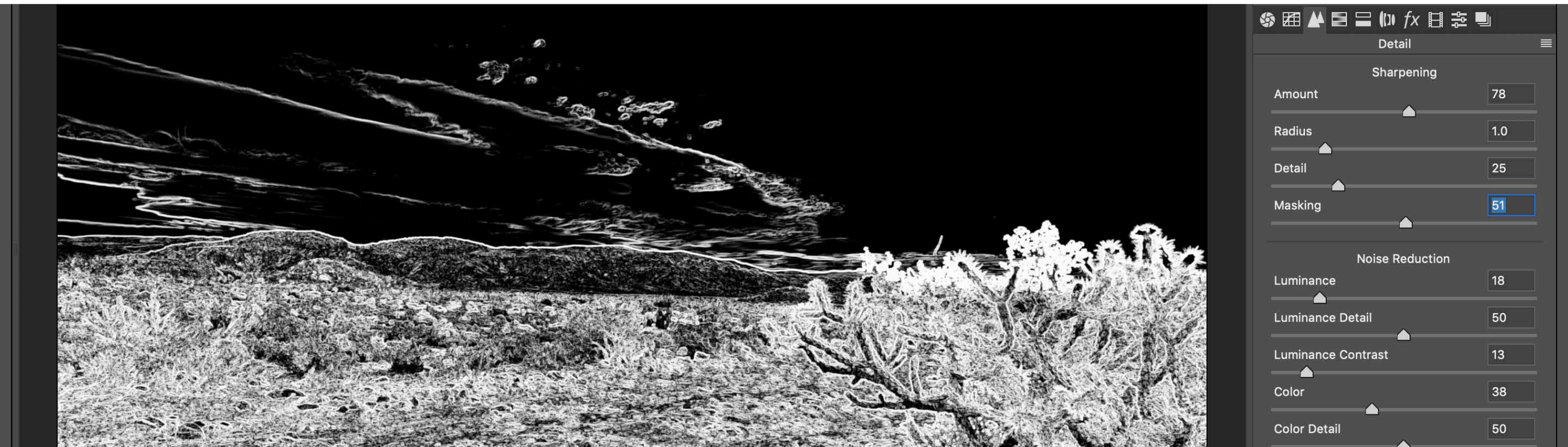


SHARPENING

In the Detail tab, you can adjust **sharpening** to bring out fine image details:

- **Amount**. Increases definition at the edges of an image. Use a lower amount for a cleaner image. When you open the file, the Camera Raw plug-in calculates the settings to use based on camera model, ISO, and exposure compensation.
- **Radius**. Use a low number for fine detail and a higher number if the photo lacks much detail.
- **Detail**. Controls how much high-frequency information is sharpened in the image and how the edges are emphasized.
- **Masking**. Controls the edge of the mask. Using a value of zero means that everything receives the same amount of sharpening. A higher number limits the sharpening to those areas near the strongest edges.

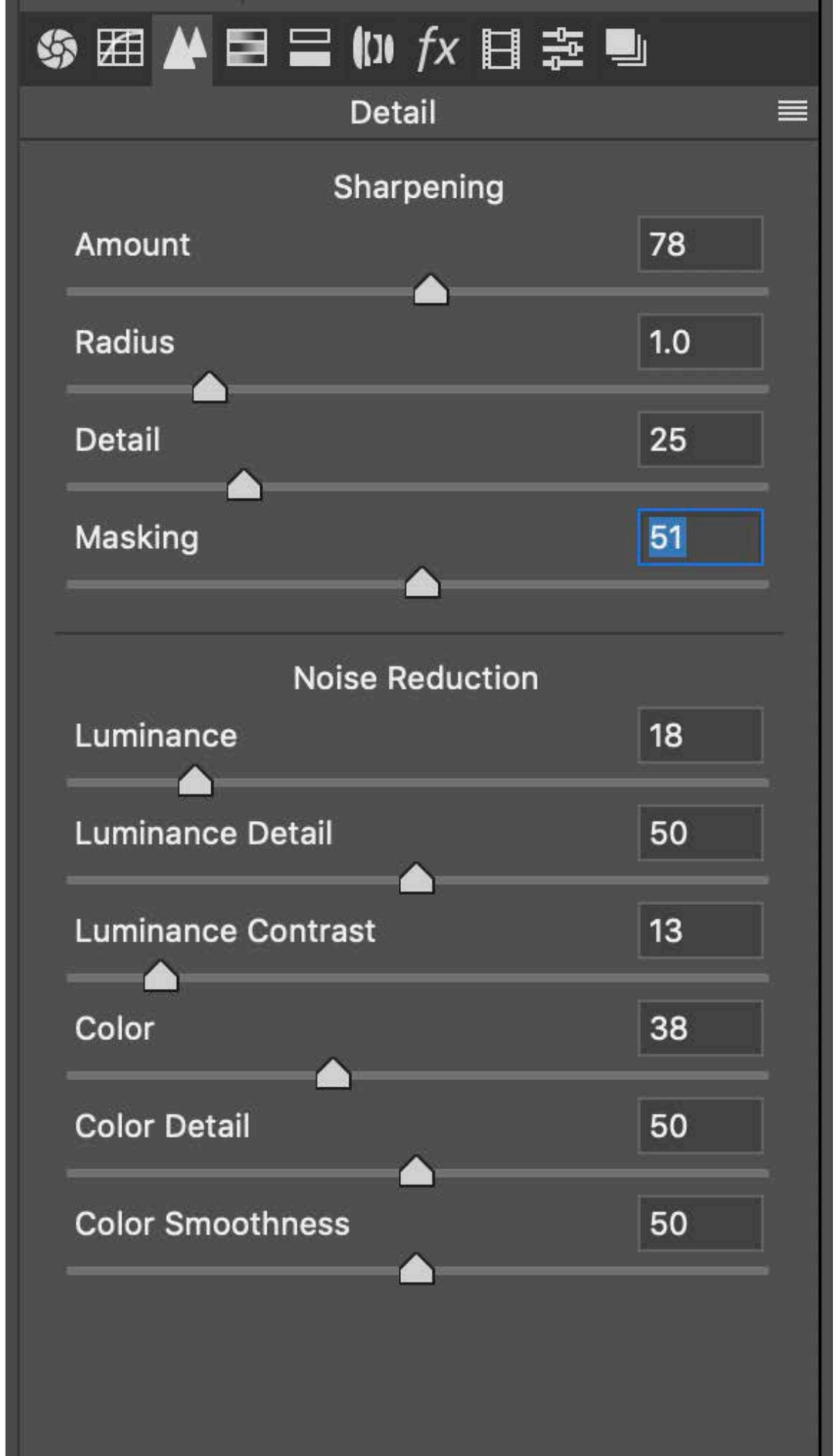
An easy way to tell how much masking to use is to hold down the **Option** (**Alt**) key while dragging the Masking slider. White areas will be sharpened; black areas are ignored (masked)..



NOISE REDUCTION

Noise reduction controls let you remove extra grain from the image:

- **Luminance**. Reduces luminance noise.
- **Luminance Detail**. Sets a threshold for the noise reduction. Higher values preserve detail but can produce noisier results. Lower values tend to produce cleaner results but likely remove some detail.
- **Luminance Contrast.** Works best for very noisy photos.
- **Color.** Reduces color noise.
- **Color Detail.** Use a higher value to protect detailed edges. A lower value preserves more color but can result in color bleeding.
- **Color Smoothness.** This is a useful control to remove areas that appear splotchy.

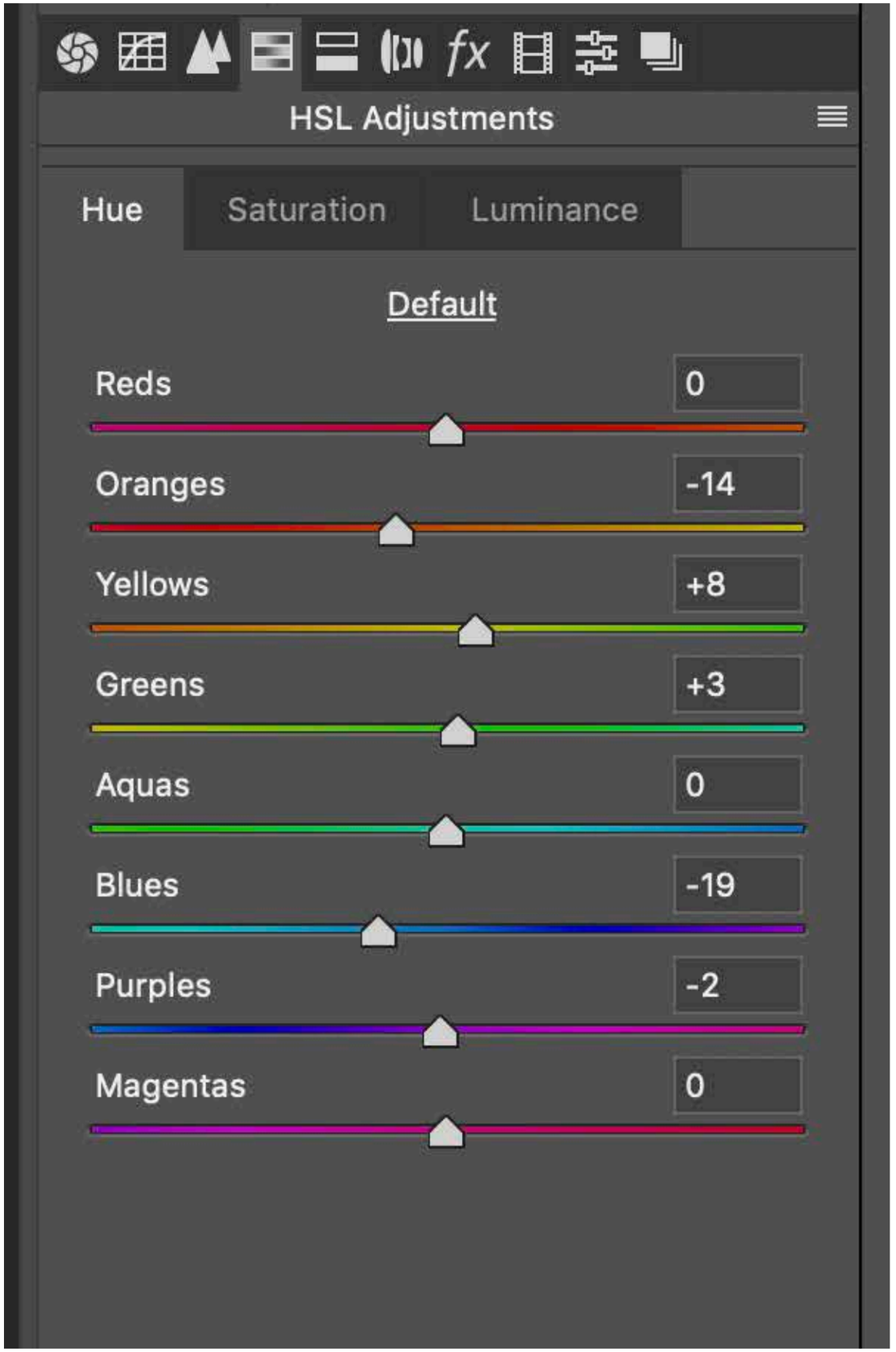


SECTION 4

HSL/ GRAYSCALE

The visible controls here are affected by the Basic tab. If you leave **Color** selected, you'll see **HSL** controls. If you chose a **Black & White** image, you'll see a **Grayscale** sliders for each tone in the Black & White image..

The **HSL/Grayscale** tab offers fine-tuning controls for Hue, Saturation, and Luminance adjustments. The most typical use of this tab is to target a particular color or tone that needs emphasis.



Targeted Adjustment Tool

Remember to use the Targeted Adjustment Tool for easy manipulation of the HSL controls.

CONTROLS

The controls for all three tabs are essentially the same. Eight sliders are offered for the different color ranges.

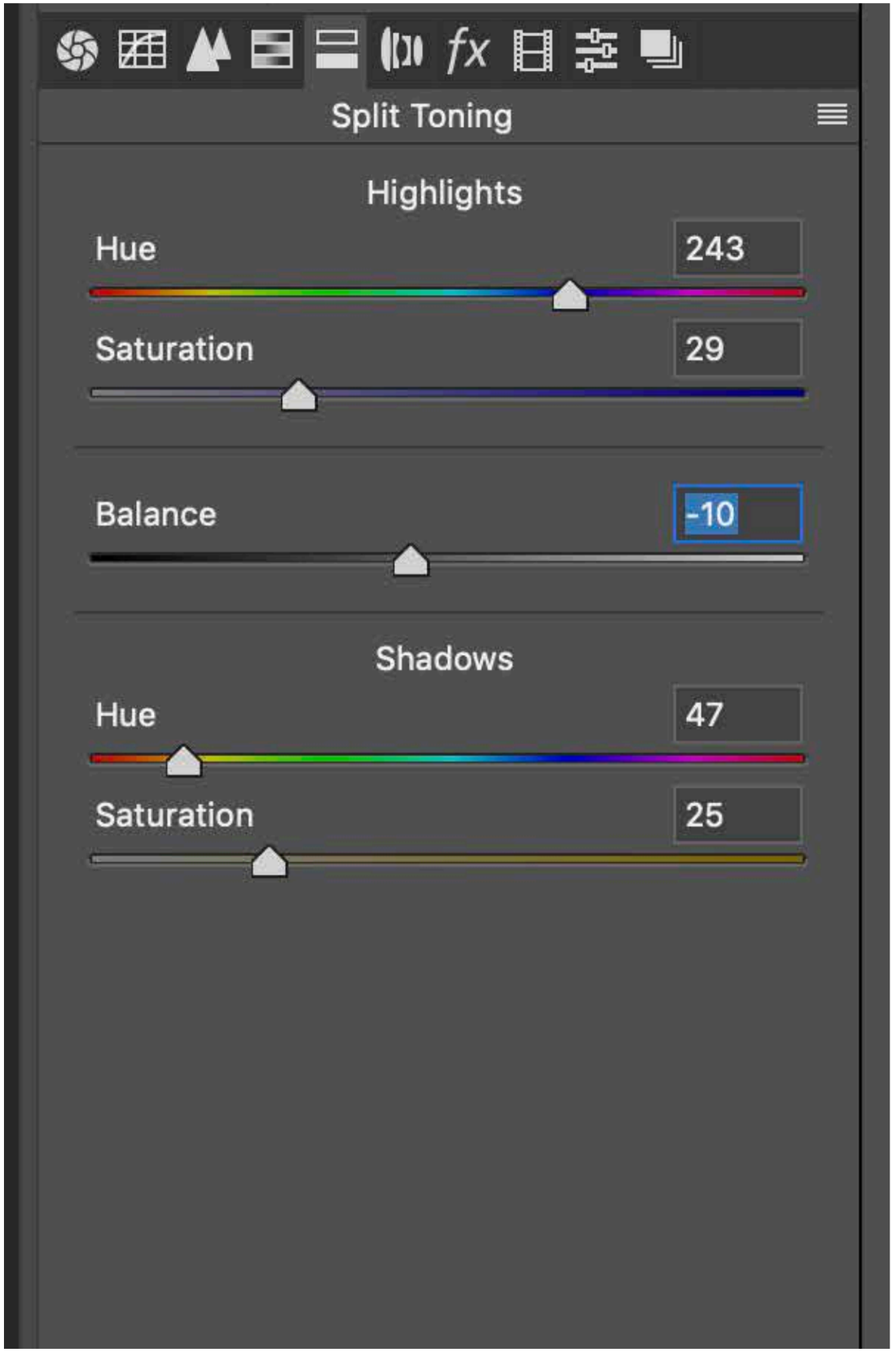
- **Hue**. This targets a particular color in the spectrum. Dragging the slider shifts the hue towards a new color. You can anticipate the affect by looking at the color spectrum for each slider.
- **Saturation**. This is the intensity of the color. Dragging to the right increases saturation. Dragging to the left reduces the intensity of the color.
- **Luminance**. Controls how light or dark a particular color is.. Drag to the right to lighten and to the left to darken. You can anticipate the affect by looking at the spectrum below each slider.

SECTION 5

SPLIT TONING

This panel is a useful way to emphasize a specific color for both the Highlights and Shadows areas. The controls can be used to create both subtle and dramatic effects.

There are really two ways to use the **Split Toning** panel. With a grayscale image, it can bring out traditional cross-processing techniques (such as a sepia tone or cyanotype). When used with a full-color image, the effect is useful for creating a vintage feeling or for emphasizing warn and cool tones.



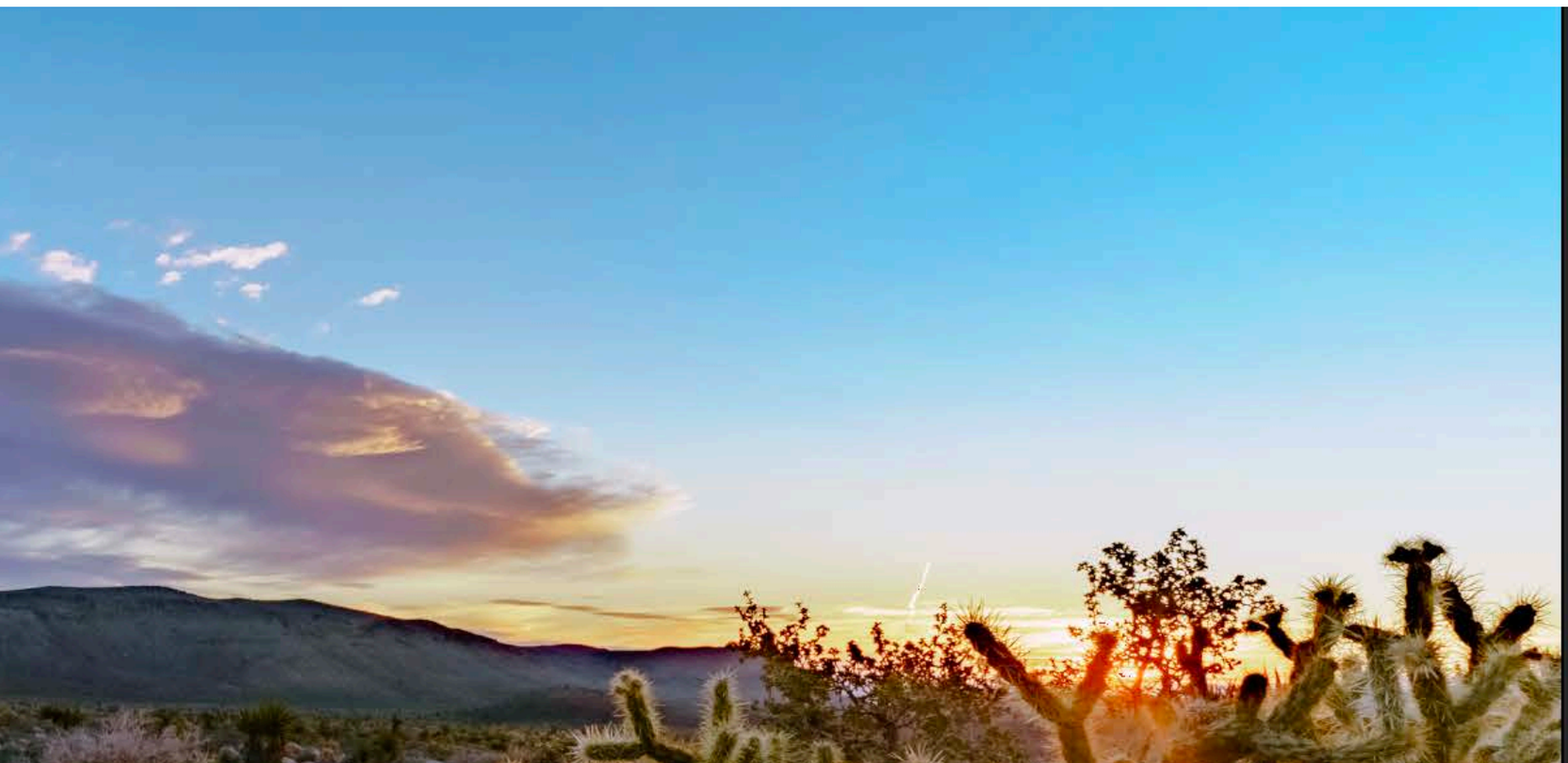
CONTROLS

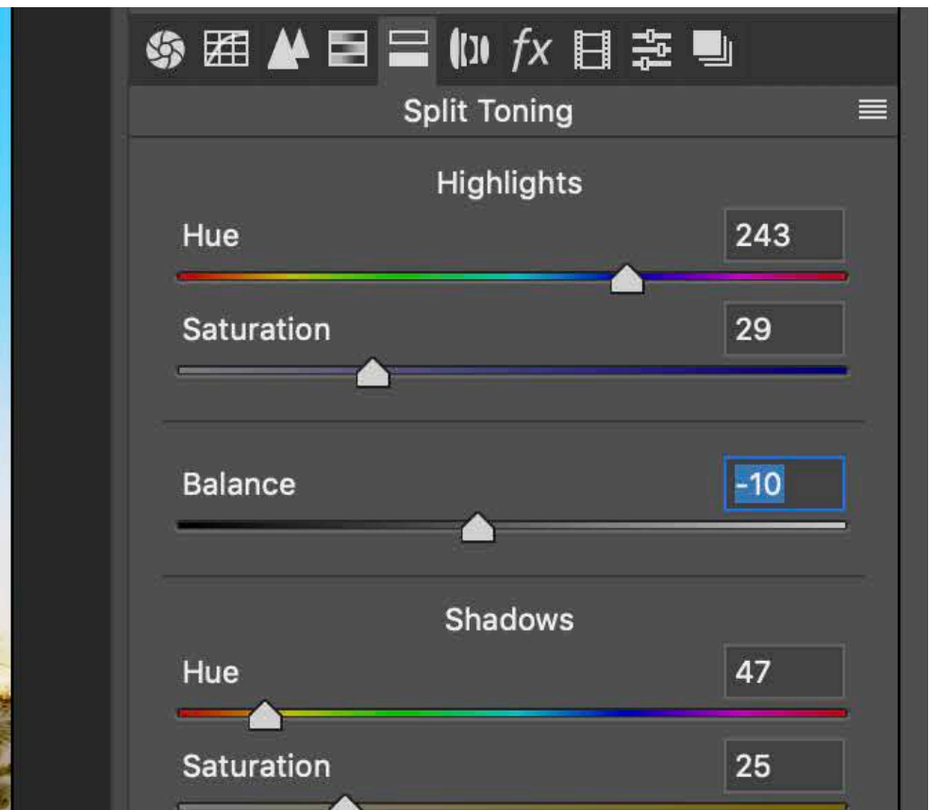
- **Highlights.** Targets the brighter areas of the image.
  - You can choose the color to emphasize with the **Hue** slider.
  - Then use the **Saturation** slider to adjust its intensity.
- **Balance.** This refines the balance between Shadows and Highlights. Drag the slider to favor one area more over another.
- **Shadows.** Works the same as the Highlights controls, except for the darker areas of the image.

SHORTCUT KEYS

Hold down the Option (macOS) / Alt (Win) key when dragging to help select the right values for split toning.

- **Option (macOS) / Alt (Win) drag the Hue slider** to temporarily view the colors at 100% saturation. This makes it easier to choose the desired color/hue. Then release the keyboard modifier and use the Saturation slider to dial in the desired amount of color**.**
- **Option (Mac) / Alt (Win) drag the Balance slider** to temporarily preview the Split Tone saturation at 100% – making it easier to see where the colors split in the image.

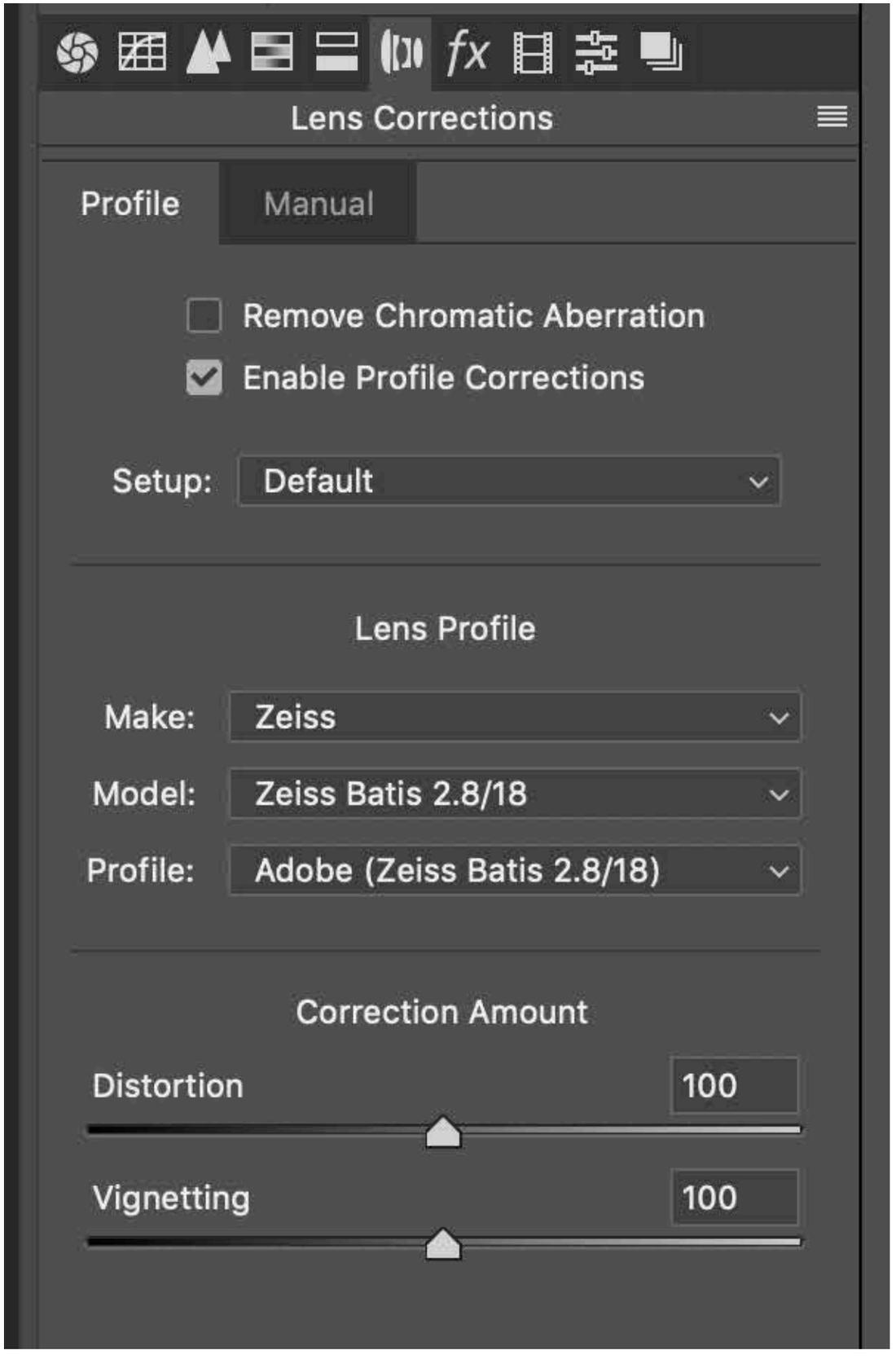




SECTION 6

LENS CORRECTIONS

The Lens Corrections tab attempts to compensate for defects in lens technology. The most common problems include distortion, chromatic aberration and vignetting. Adobe offers an extensive database of lens profiles that can fix a variety of problems automatically. Additionally, manual controls can be used for further refinement or for un-profiled lenses.



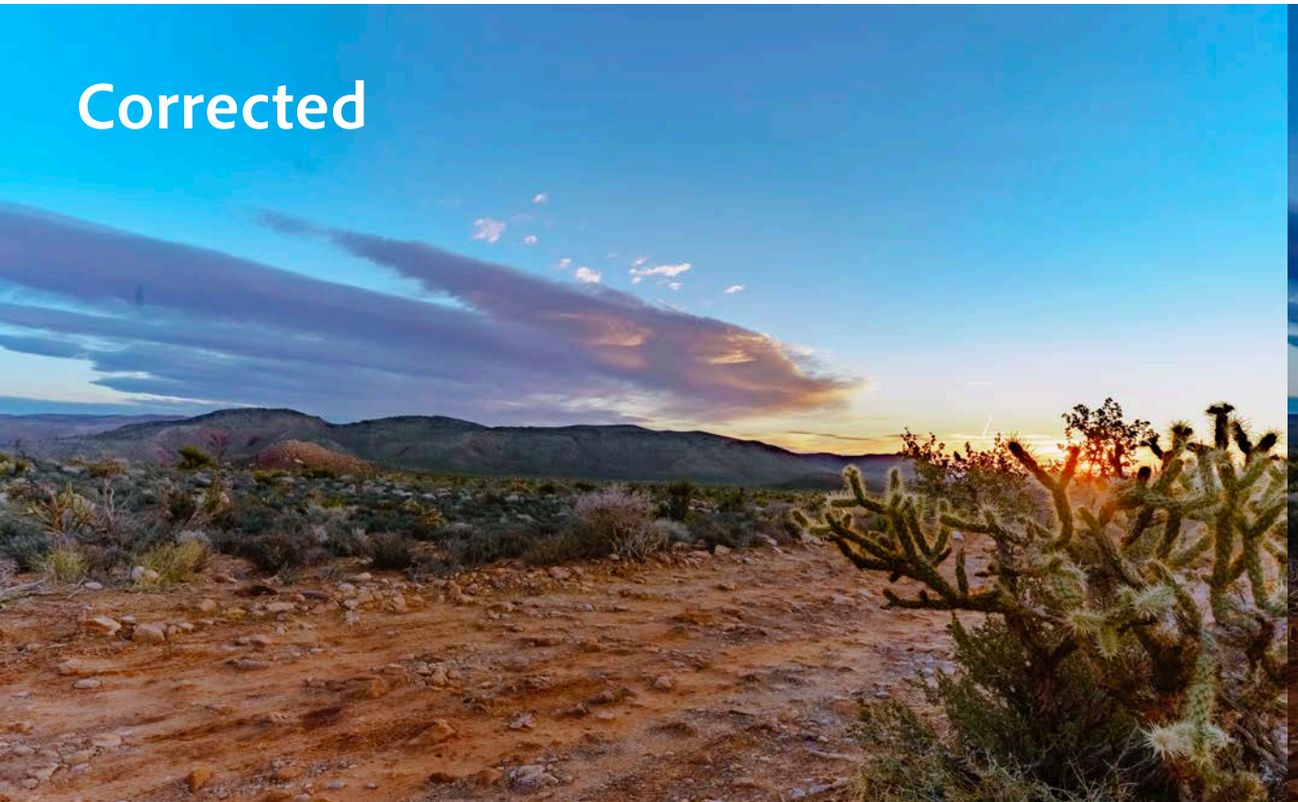
Create Your Own Profiles

Print out the calibration targets and capture a series of images with your camera. This software then builds a unique profile to remove vignettes, distortion, and aberration.
https://helpx.adobe.com/photoshop/digital-negative.html

PROFILE

- **Remove Chromatic Aberration:** This checkbox automatically corrects blue-yellow and red-green fringes Chromatic aberration often occurs in images made with large apertures (especially in high-contrast areas). It's a good practice to always check the Remove Chromatic Aberration box.
- **Enable Profile Corrections:** Checking this box will enable automatic correction. Adobe Camera Raw will analyze the metadata of the file and attempt to correct distortions in common camera lenses. The profiles are based on EXIF metadata that identifies the camera and lens used. If no profile is automatically found, you can attempt to choose a compatible option.

1. If Camera Raw doesn't find a suitable profile automatically, choose the Make, Model, and Profile.
2. Use the **Distortion** slider to apply the adjustment. The default value 100 applies 100% of the distortion correction in the profile. Values over 100 apply greater correction to the distortion; values under 100 apply less correction to the distortion.
3. Use the **Vignetting** slider to remove dark edges. The default value 100 applies 100% of the vignetting correction in the profile. Values over 100 apply greater correction to vignetting; values under 100 apply less correction to vignetting.



MANUAL

If you want to refine the lens correction even more (or if no profile is available) try out the manual controls.

- **Distortion**: Drag to the right to correct barrel distortion. This will straighten lines that bend away from the center. Drag to the left to fix pincushion distortion. This straightens lines that bend toward the center.
- **Defringe:** These controls can tackle any global purple or green fringes .
  - **Purple Amount/Green Amount**
    Specifies the amount of defringing applied to the selected Purple Hue/Green Hue. The higher the amount, the more defringing is applied.
  - **Purple Hue/Green Hue**
    Applies defringing to the selected Hue range. Drag either end-point control to expand or decrease the affected range of colors. Drag between the end point controls to slide the hue range.

Sample the Fringe

To correct fringing with the Eyedropper tool, do the following:

1. **Zoom into the fringe area to facilitate accurate color picking.**
2. **Press and hold Command (Mac) or Control (Win) to show the Eyedropper tool on the image.**
3. **Click purple/green fringe colors to select them more accurately.**

See the Fringe Clearly

Be sure to zoom into an area that has very dark or black detail against a very light or white background. This is where you'll likely see color fringing.

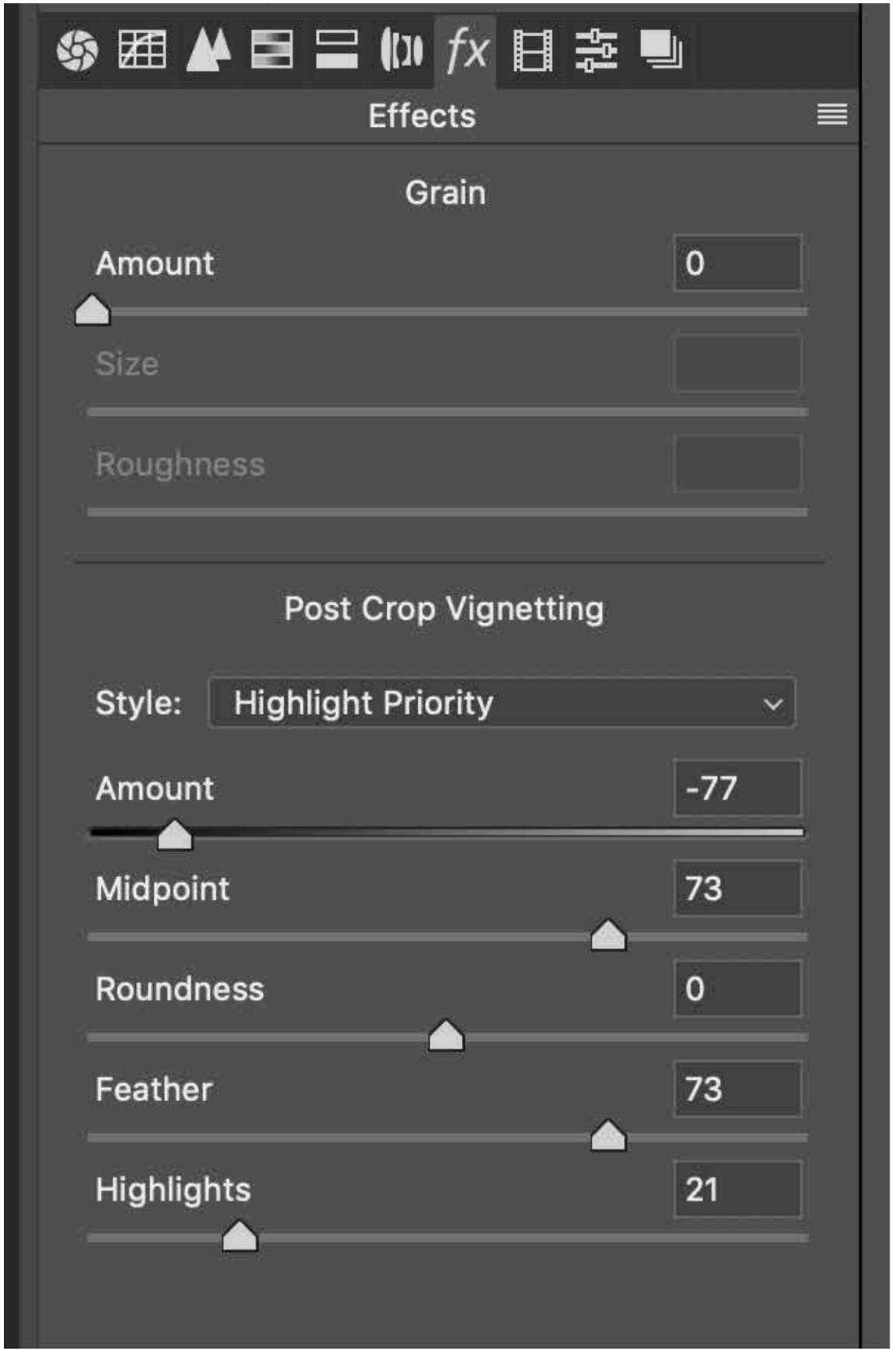
To more clearly see the color fringing, press Alt (Windows) or Option (macOS) as you move a slider to hide any color fringe corrected by other color sliders.

- **Vignetting:** This corrects an unwanted exposure change at the edge of the image.
  - **Amount**
    Move the Amount slider to the right to lighten the corners of the image. Move the slider to the left to darken the corners of the photo.
  - **Midpoint**
    Drag the Midpoint slider to the left to apply the Vignette correction to a larger area away from the corners. Drag the slider to the right to restrict the adjustment to a smaller area near the corners.

SECTION 7

EFFECTS

The Effects tab can be used to stylize the image. It is used to add photographic imperfections that were more typical with film-based cameras. You can choose to simulate film grain or apply a post crop vignette to the edges.



GRAIN

While many photographers strive for noise free images, the lack of grain in a digital image often looks artificial to photography purists. Adding a small amount of grain can restore the traditional filmic qualities to a photograph. For best results zoom to a 100% view.

- **Amount:** How much grain is added to the image.
- **Size: The relative size of the grain.**
- **Roughness:** How much contrast the grain pattern adds.

POST CROP VIGNETTING

While the Lens correction can remove a vignette, some users like the effect. But if the image has been cropped the vignette may no longer be applied equally to all corners. This is where the Post Crop vignetting controls come in handy.

- **Style**: You'll find three different options for how the vignette shades the image.
- **Amount:** Use a negative value to darken the edges or a positive to brighten them.
- **Midpoint**: Controls how close the vignette appears to the corner of the image.
- **Roundness:**. A positive value creates a circular effect, whereas a negative value takes on an oval shape.
- **Feather**: Can create a gentler transition between the affected areas.
- **Highlights**: If you're using a very dark vignette, the Highlights slider can be used to protect the brightest

Feather Off... Feather On

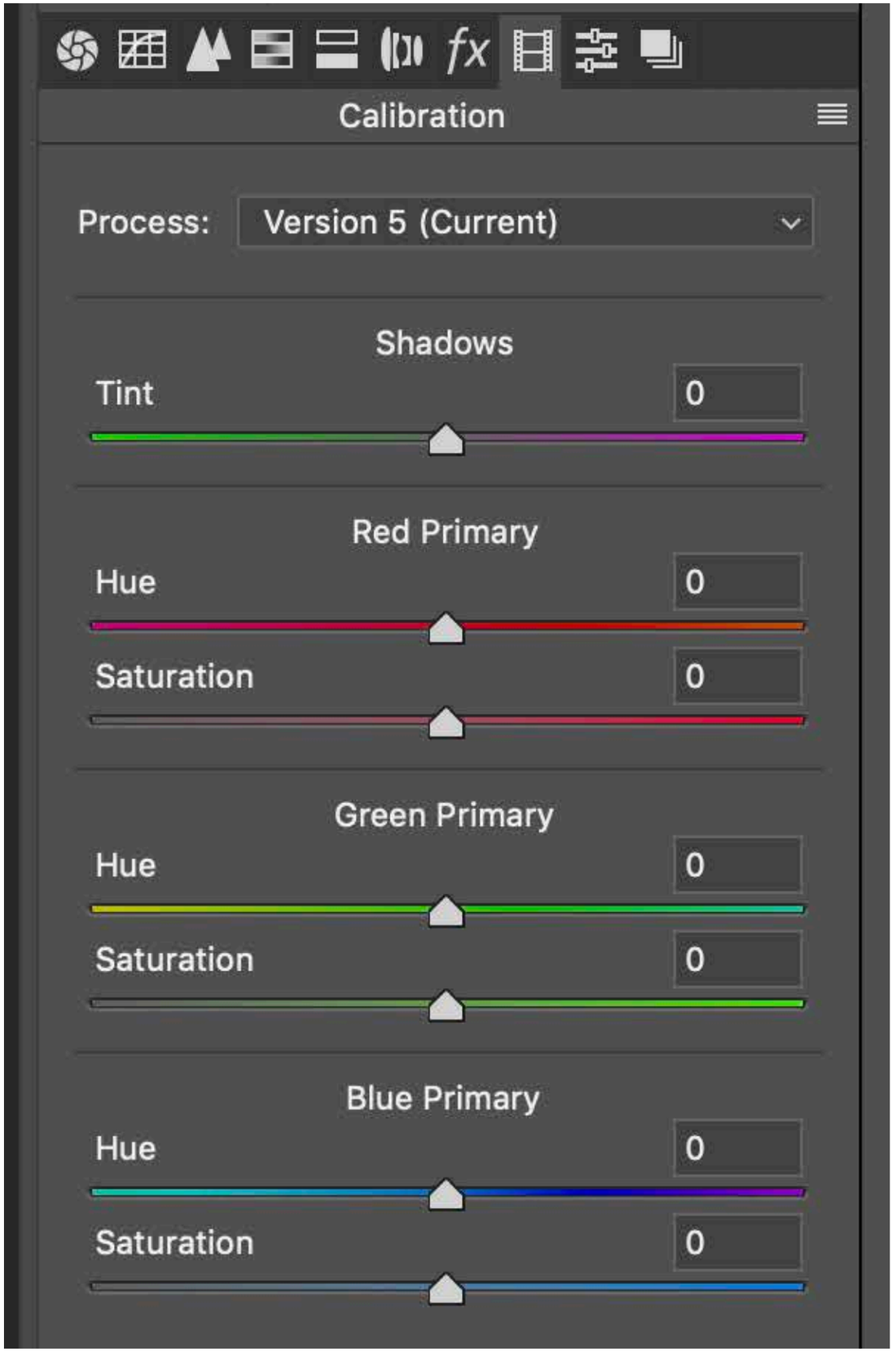
: Move the Feather slider all the way to the left to see the area affected by the vignette. Adjust the Midpoint and Roundness to shape the vignette. Finally adjust the Feather control.

SECTION 8

CAMERA CALIBRATION

The Calibration tab is used to choose which technology is accessed under the hood to render raw files. Adobe has continued to improve their raw engine, yet makes older ones accessible for backwards compatibility and user preference.

Depending on which process version you use, different options and settings are available in the Adobe Camera Raw dialog. In most cases, stick with the most current process.



PROCESS VERSIONS

- **Process Version 5**
  Any image that is first edited in Camera Raw 11 uses Process Version 5. This version features improved **high ISO rendering** that helps remove purple color casts. These can be visible in the shadows of lower light images. PV5 also features an improved **Dehaze** slider. You can easily add haze for creative reasons when you move the Dehaze slider to the left.

- **Process Version 4**
  If an image is edited for the first time in Camera Raw 10 it uses process version 4. This version adds support for the **Range Mas**k feature. It also has an improved **Auto Mask** that handles image noise better. Any PV 3 image is automatically upgraded to PV 4 if it does not have an Auto Mask adjustment applied.

- **Process Version 3 (2012)**
  This is used for mages edited for the first time in Camera Raw 7. It offers new tone controls and new tone-mapping algorithms for high-contrast images. This introduced **Highlights**, **Shadows**, **Whites**, **Blacks**, **Exposure**, and **Contrast** in the Basic panel. You can also apply local corrections for white balance (Temp and Tint), Highlights, Shadows, Noise, and Moiré with the **Adjustment Brush**.

- **Process Version 2 (2010)**
  Images edited in Camera Raw 6 used PV 2 by default. PV 2 offers improved sharpening and noise-reduction from the previous process version, PV 1.

- **Process Version 1 (2003)**
  The original processing engine used by Camera Raw versions 5.x and earlier.

Go For the Latest Model

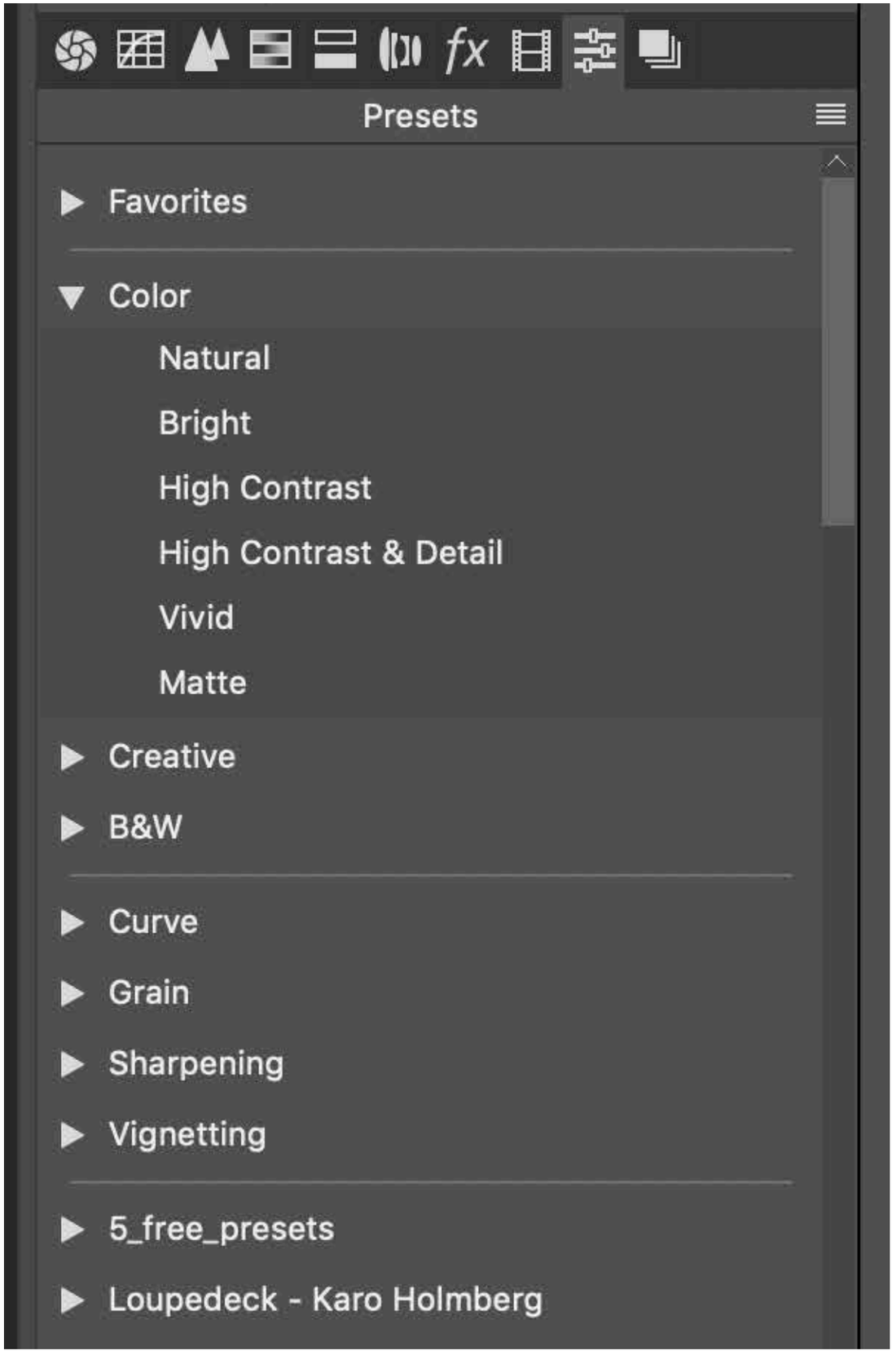
A legacy raw file will be much improved by using the latest Process Version, most notably reduced noise inherent in some early digital cameras.

SECTION 9

PRESETS

If you like a setting you've created, you can save it as a preset, which makes it easier to reload in the future. Remember that custom presets can serve as a great starting point (especially if you have several images from the same shoot).

To make a preset, just click the **pad-shaped button** at the bottom of the window.



Beyond Presets

Be sure to explore the options of custom profiles. They are much more powerful than presets and support auto-toning, LUTs, and more. Be sure to download and read the Profiles SDK. https://helpx.adobe.com/photoshop/digital-negative.html

SECTION 10

SNAP SHOTS

Another way to store a version of your image is to create a **snapshot**. Each snapshot is essentially a recording of the image's current state.

You can in fact create multiple snapshots for a raw file and easily switch between them. The Snapshots are stored when you click the **Done** button or **Open**.

CHAPTER 3

ADVANCED **CONTROLS**

Now that you've mastered the essential sliders, it's time to explore the deceptively powerful tools and commands. These often go overlooked by most users. Sure most will stumble upon the Crop or Straighten tools, but there are many hidden shortcuts and power techniques that really save you time.

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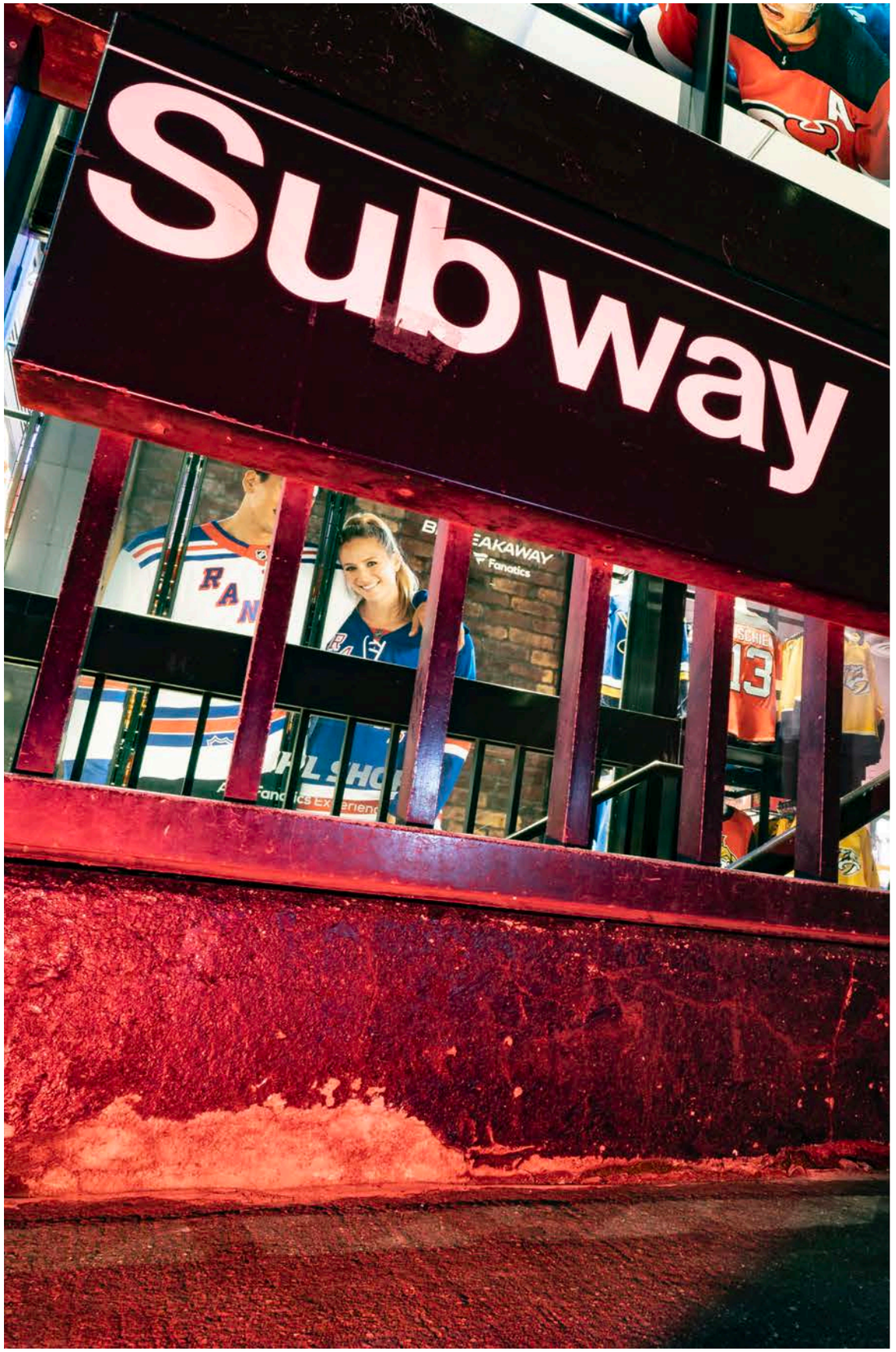
SECTION 1

ENHANCE **DETAILS**

If you want to ensure an increase in crisp detail and improved color rendering, try the Enhance Details command. This option is powered by Adobe Sensei and can produce more accurate renditions of edges, and fewer artifacts.

This option is most useful when you intend to make a large print (where fine details are more visible.). It works for raw images captured with a Bayer sensor (Canon, Nikon, Sony, and others) and Fujifilm X-Trans sensors.



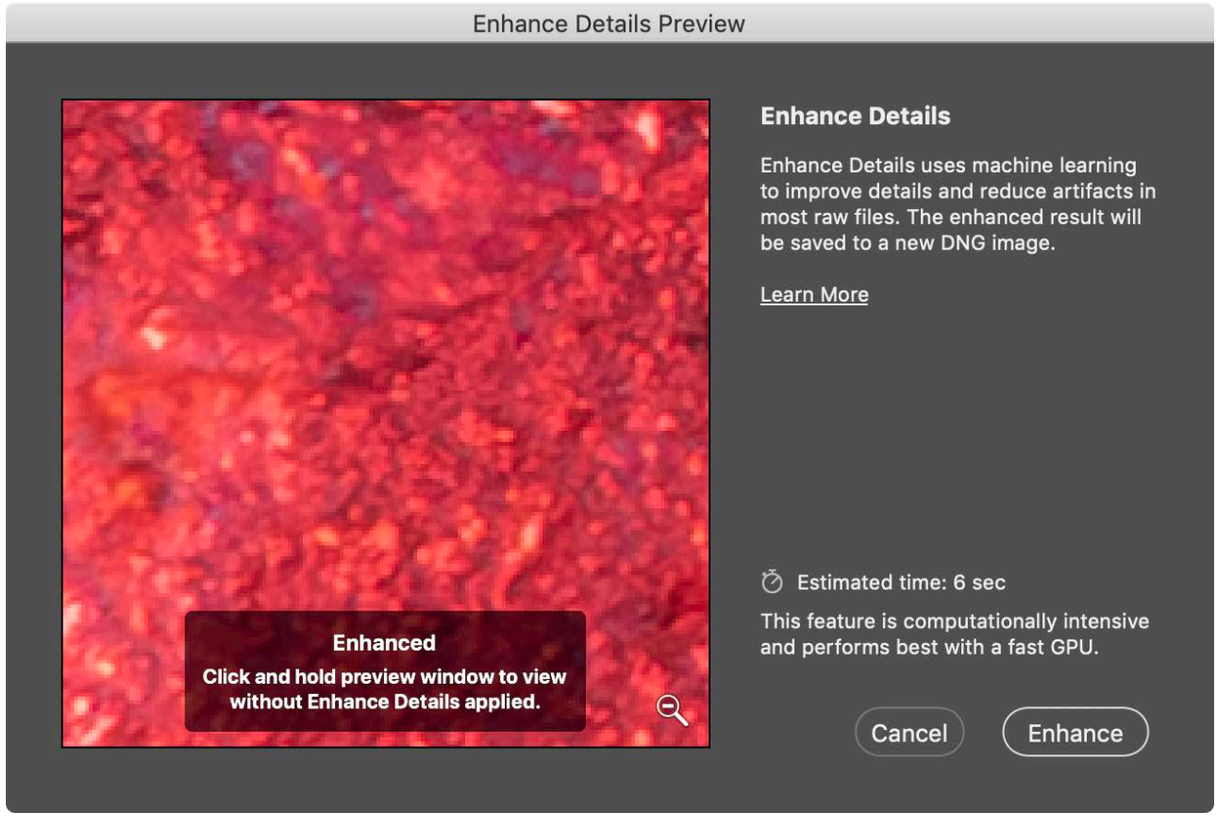
ENHANCE DETAILS

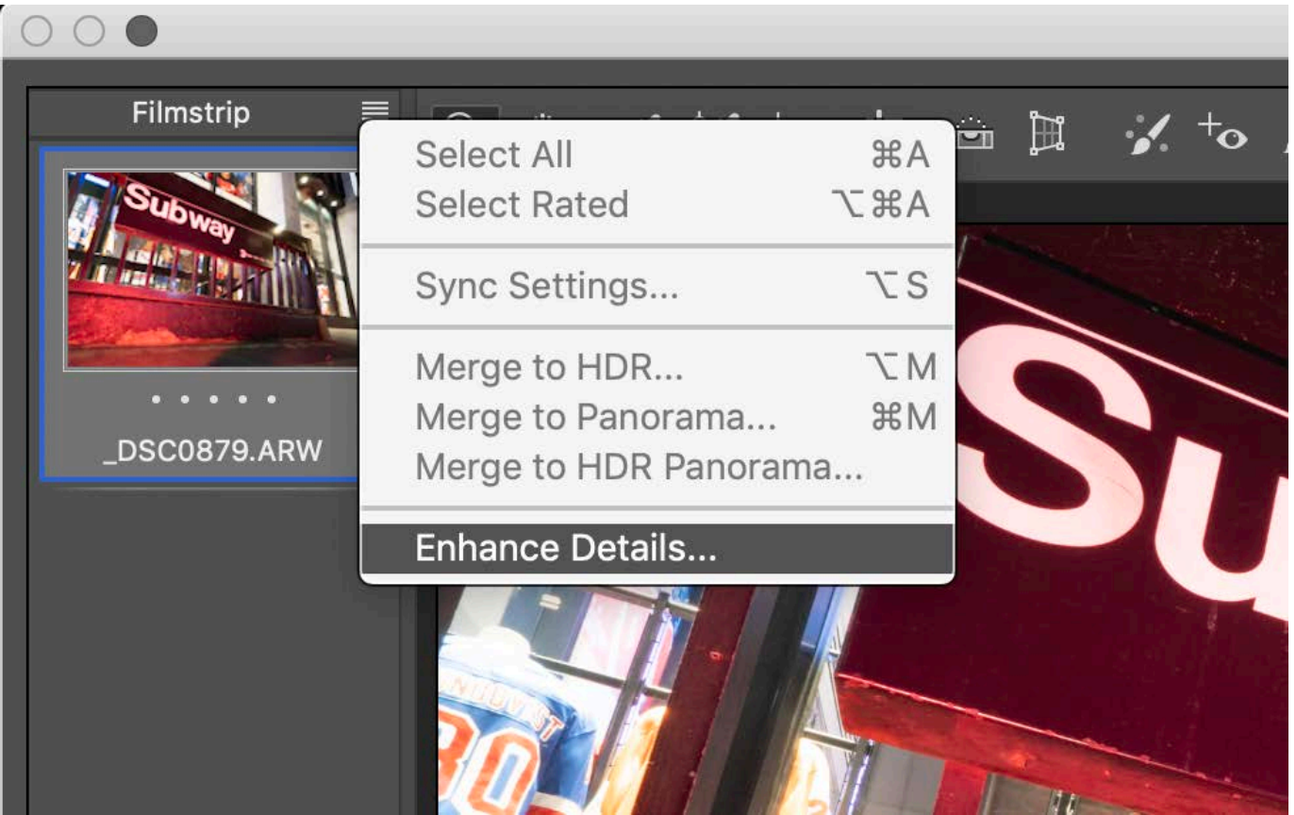
To get started, open one or more supported raw files open in Adobe Camera Raw.

1. Ctrl-click (on Mac)/right-click (on Windows) the image.

2. Click the menu at the top of the filmstrip and choose **Enhance Details**.

   The Enhance Details Preview dialog box previews the effect. The hand cursor can be dragged to change the preview area. Click and hold to see a before view of the enhance effect.





You can also hold down and move the hand cursor to preview the before and after effect on different regions of the image.

3. Click the **Enhance** button to create an enhanced DNG version of your photo.

   The new DNG file is automatically stored next to the original source image on your hard drive.

SUPPORTED FORMATS

Enhance Details is only applicable to Bayer and X-Trans mosaic raw files.

UNSUPPORTED FORMATS

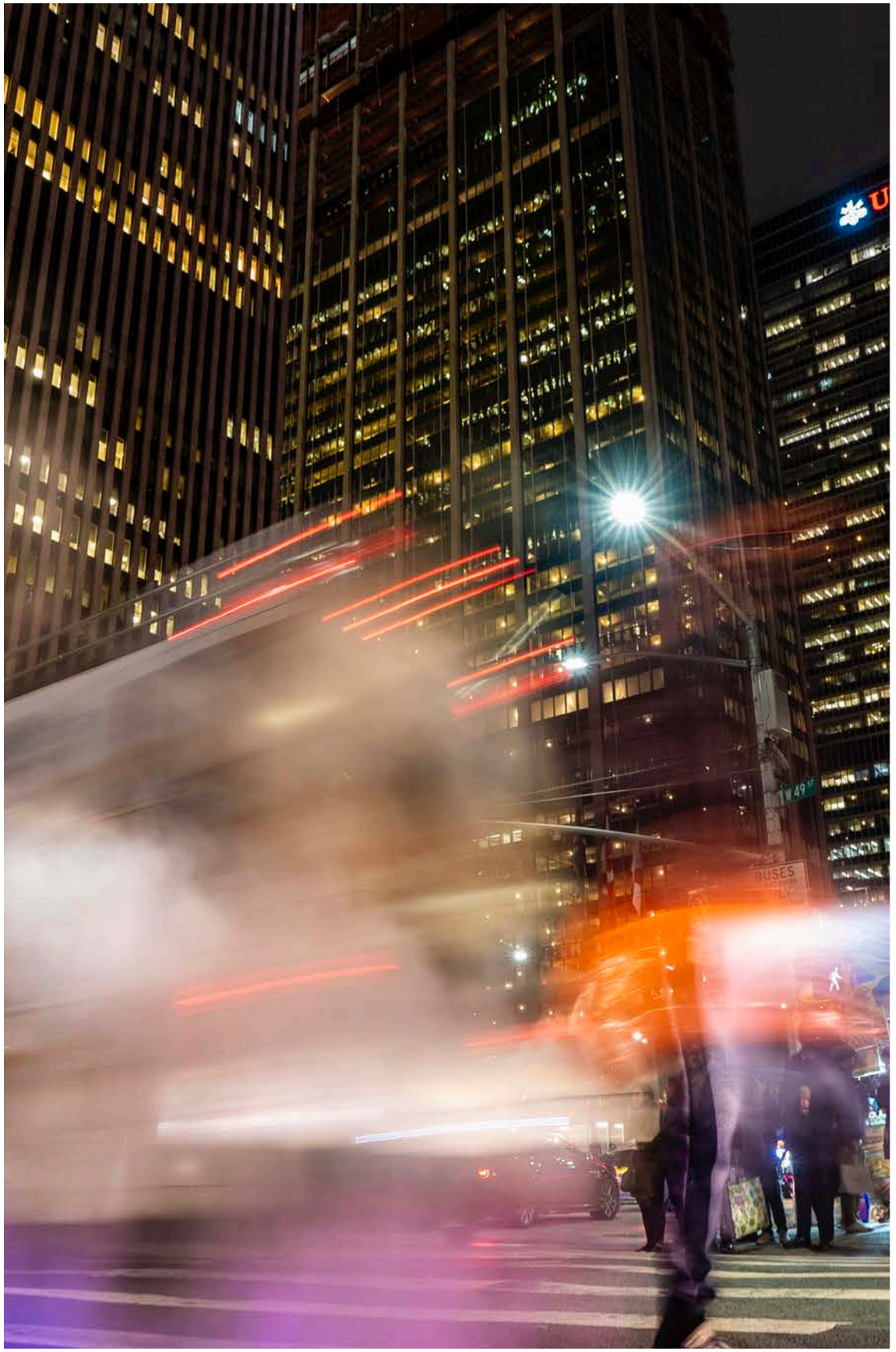
Enhance Details does not apply to the following types of source images:

- Non-raw files such as a JPEGs, TIFFs, and HEICs
- Linear DNGs (including HDR and pano DNG images created inside Lightroom and Camera Raw)
- DNG proxies and Smart Previews
- Monochrome raw files (such as Leica M MONOCHROM)
- Four-color cameras
- Foveon sensor images
- Fujifilm cameras with SR, EXR, or 2x4 mosaic sensors.
- Canon S-RAW/M-RAW files
- Nikon small raw files
- Pentax Pixel Shift Resolution (PSR) files
- Sony ARQ files
- Video files

SECTION 2

CROP & STRAIGHTEN

Cropping is all about precision. Often, you'll want to crop to a specific aspect ratio. Sometimes its for the screen (video projects and slideshows) as well as print output. This is because you often need the shape of a photo to precisely match a target.

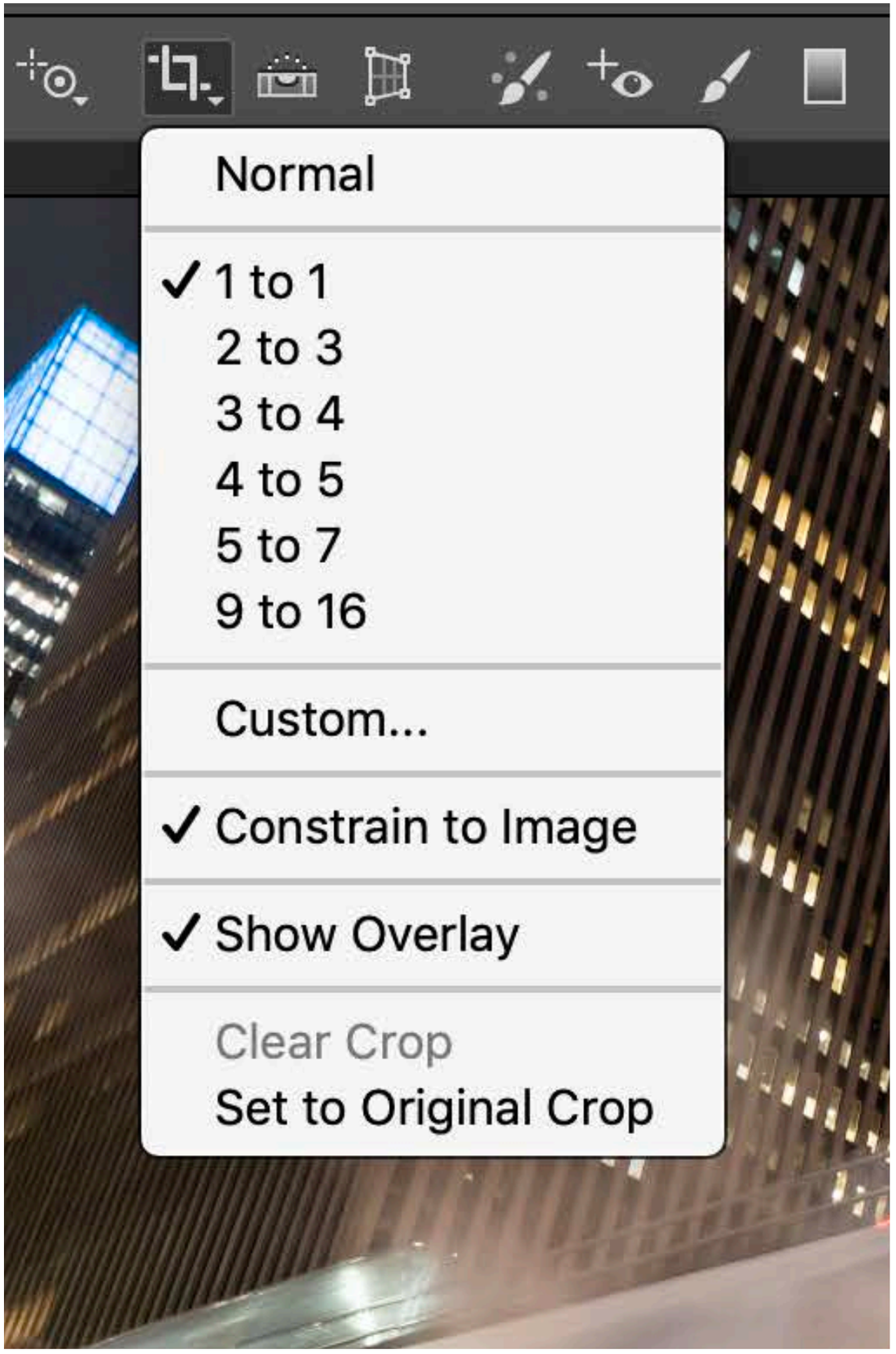


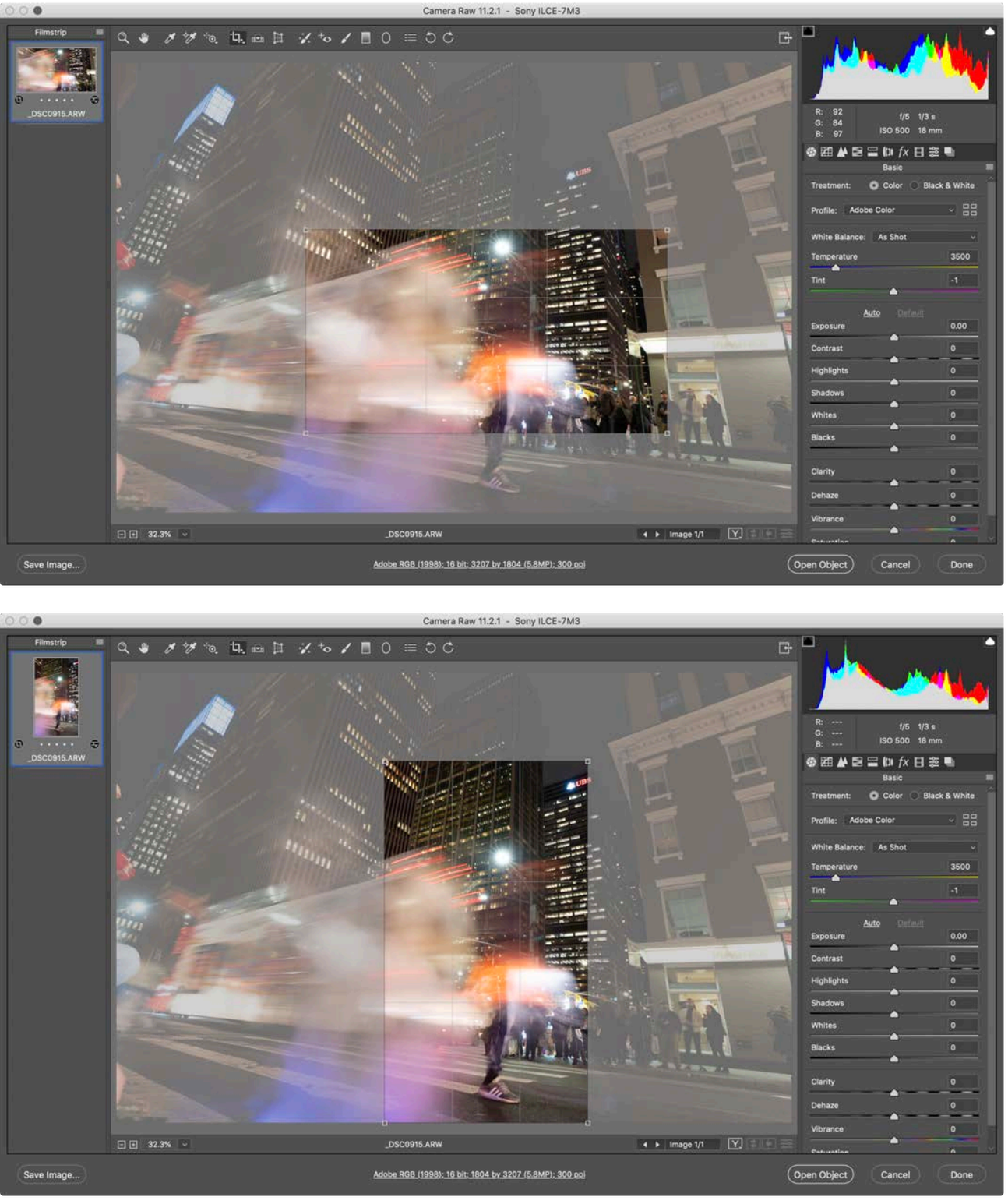
CROPPING

Cropping is very easy to achieve, but often involves an artistic decision.

1. Select an image for cropping.
2. Press the **C** key to invoke the Crop tool.
3. Click and hold on the **Crop tool** icon in the toolbar to see a drop down menu for aspect ratios. The ratios can be easily reversed then using the tool to switch between vertical and horizontal.

- **Normal**: An unconstrained cropping tool..
- **1 to 1:**: This is a square-shaped crop.
- **2 to 3:** A common ratio widely used for prints.
- **3 to 4:** A ratio used by many older screens
- **4 to 5:** This is a popular print size.
- **5 to 7:** A crop used for prints and frames.
- **9 to 16:** The aspect ratio for most modern screens.
- **Custom:** Enter your own ratio





4. Drag a crop handle to crop the image. You can drag with a horizontal or vertical emphasis to change the ratio of cropping.

5. You can also click and drag to select the **Crop Frame** to freely position the crop.

6. You can modify the crop behavior if needed with a keyboard shortcut. Press the **X** key to toggle the orientation of the crop between portrait and landscape.

7. Press **Return** (or **Enter**) to apply the crop. You can exit without cropping by pressing the **Escape** key.

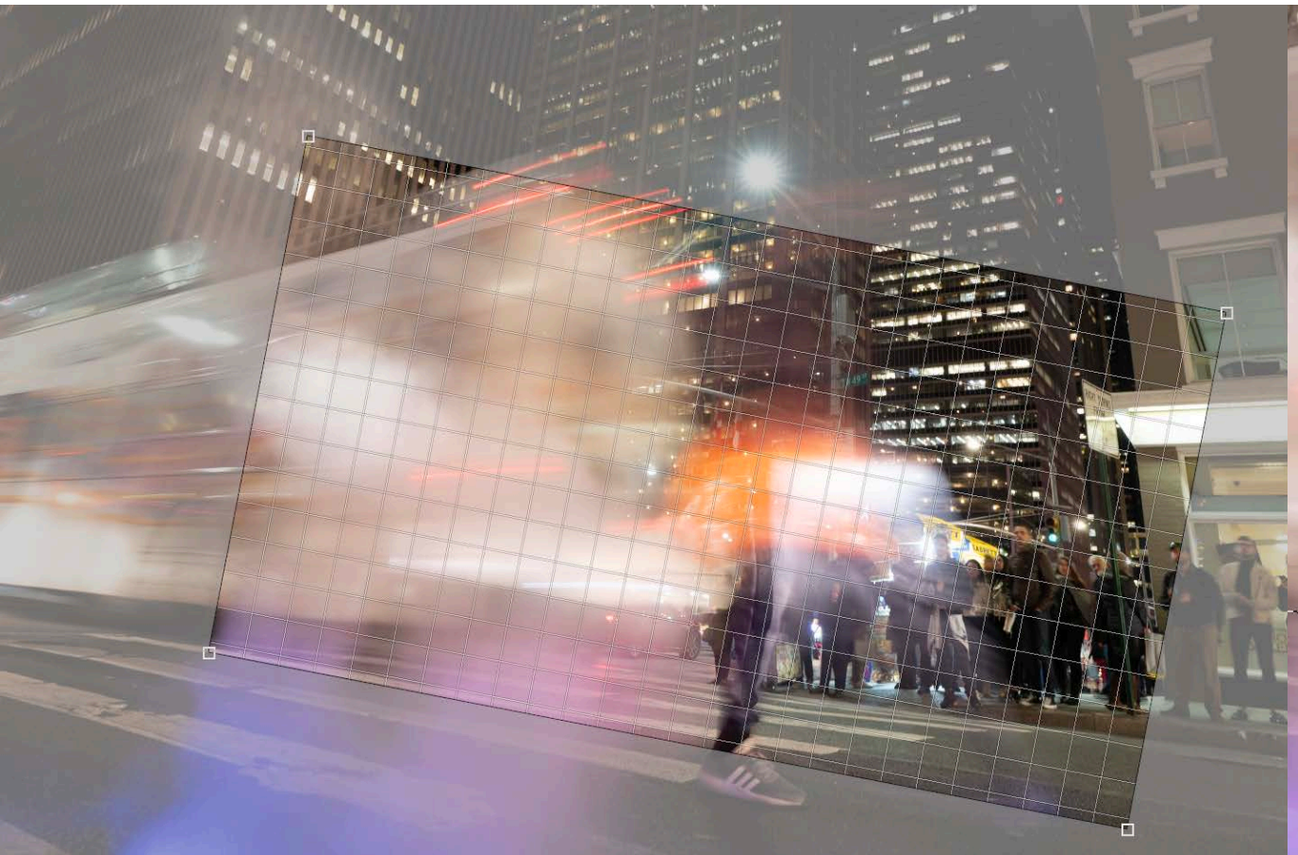
Remember, all cropping is nondestructive. You can always revert a cropped image by choosing ***Set to Original Crop*** *from the pop-up menu to restore an image to its original crop.*

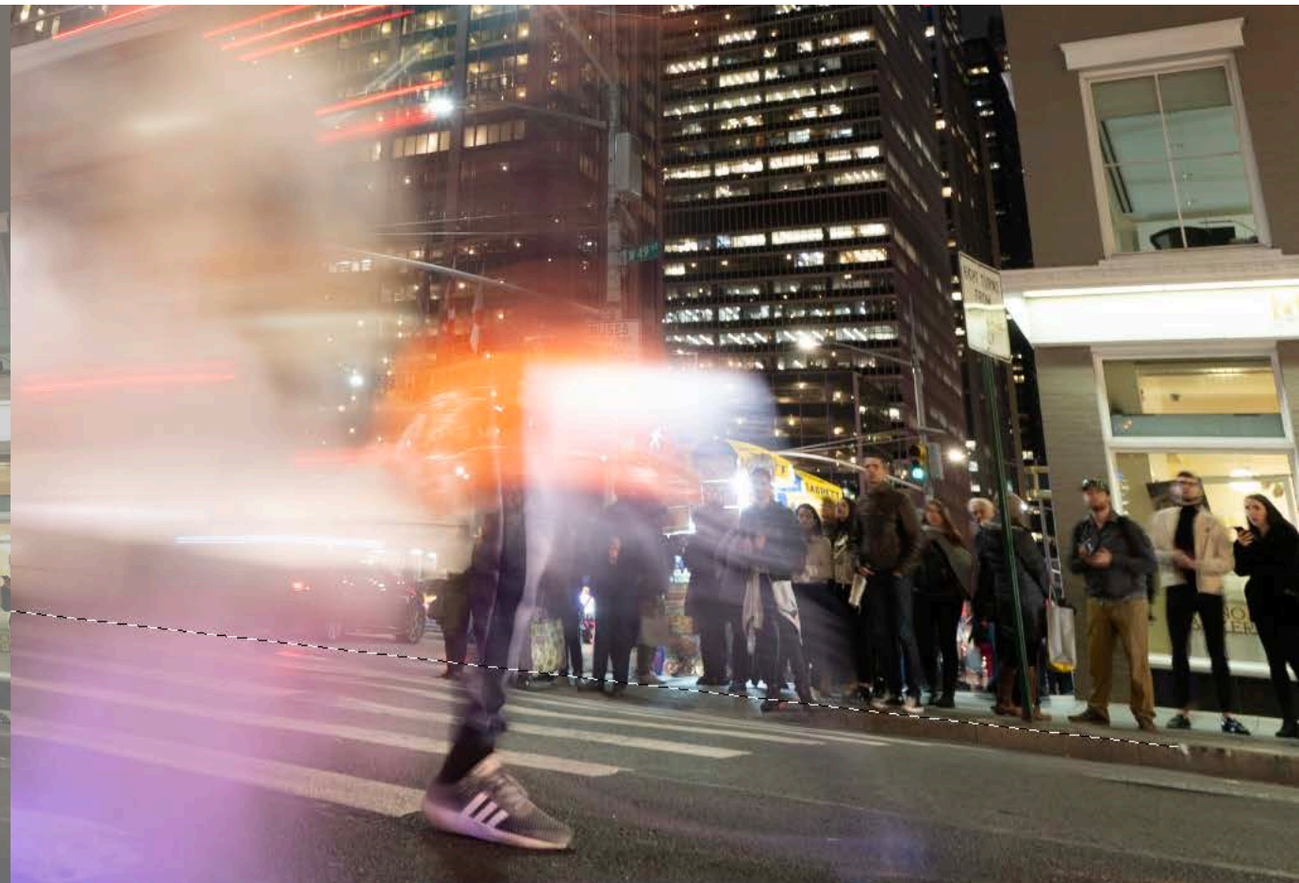
STRAIGHTENING

A crooked photo can be downright distracting (unless you really wanted it that way, of course). Fortunately, Adobe Camera Raw makes it easy to fix an unbalanced ball head. But what happens if you need to rotate the image or even flip it? Not a problem these are all easy fixes.

There are three ways to easily straighten a photo in Adobe Camera Raw..

- Move the pointer to just outside a corner crop handle when using the Crop tool. The cursor will switch to **Rotate**. You can now drag to freely rotate the image (up to 45˚ either way).
- Choose the **Straighten Tool** and drag to draw along a horizontal or vertical line.
- **Double-click** the Straighten Tool to automatically straighten the image.

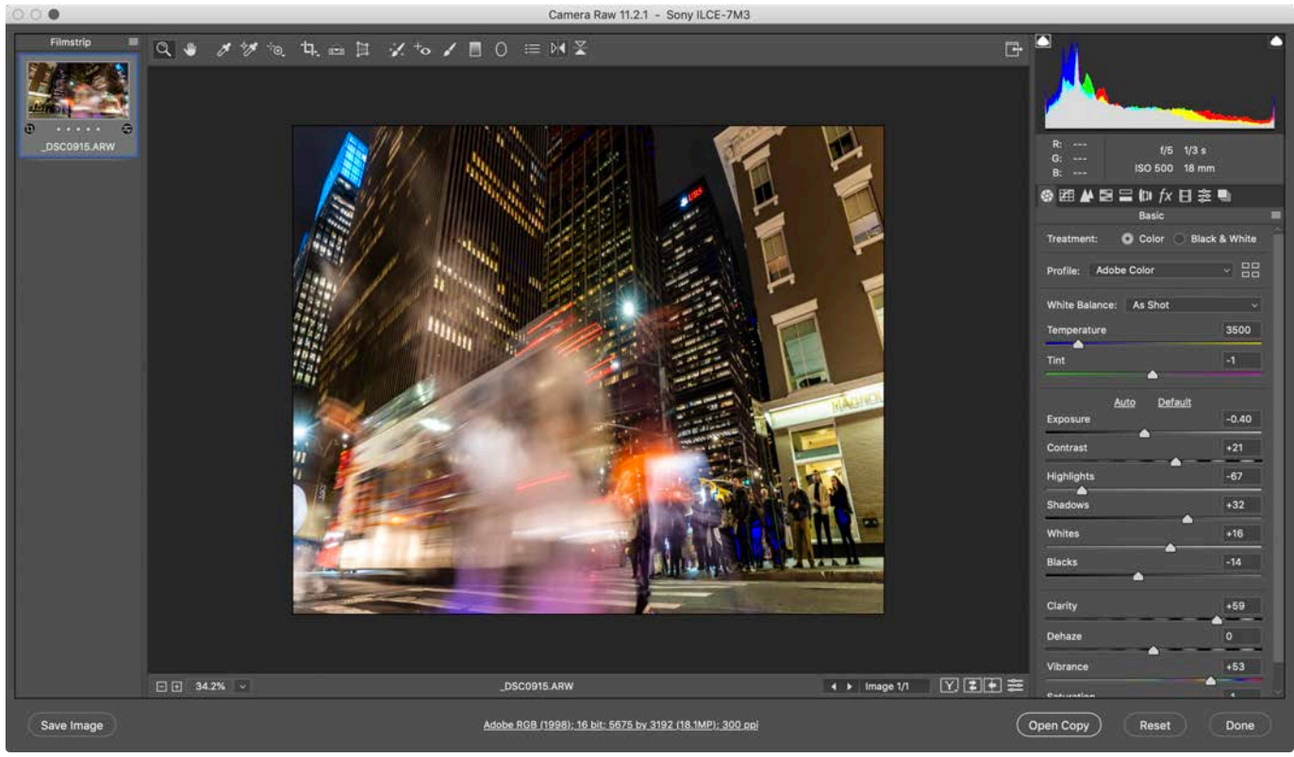


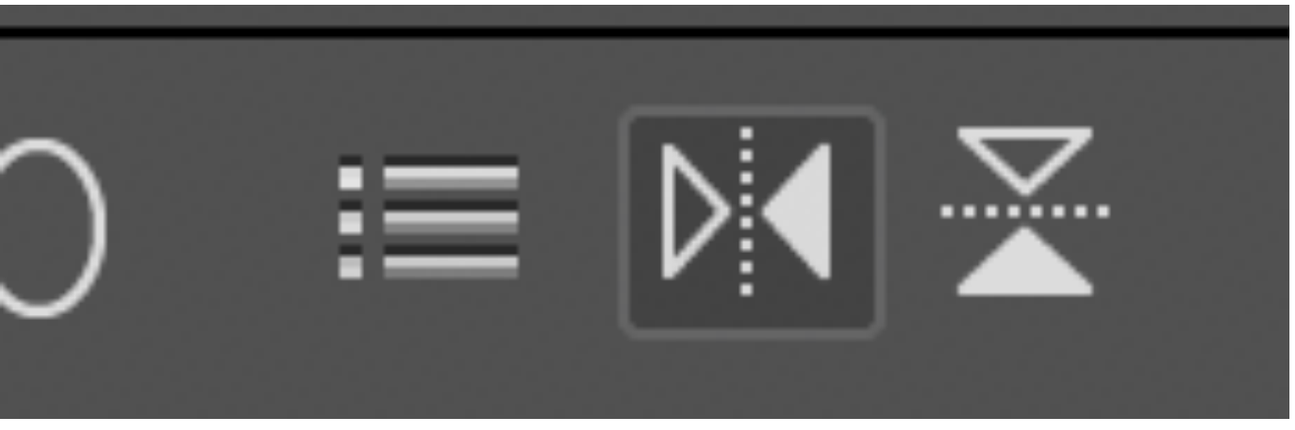


ROTATE OR FLIP A PHOTO

While your camera can usually flag images properly for portrait and landscape, sometimes the motion position sensor in your in your camera fails. Other times you might be shooting into a mirror or reflection and want to flip the image.

- To rotate the image 90˚ Click the **Rotate Clockwise** (R) or **Rotate Counterclockwise** (L) button in the toolbar.
- To flip the photo horizontally or vertically, hold down the Option (Alt) key. The Rotate buttons become **Flip image horizontally** and **Flip image vertically**. This will make a mirror image of the photo.

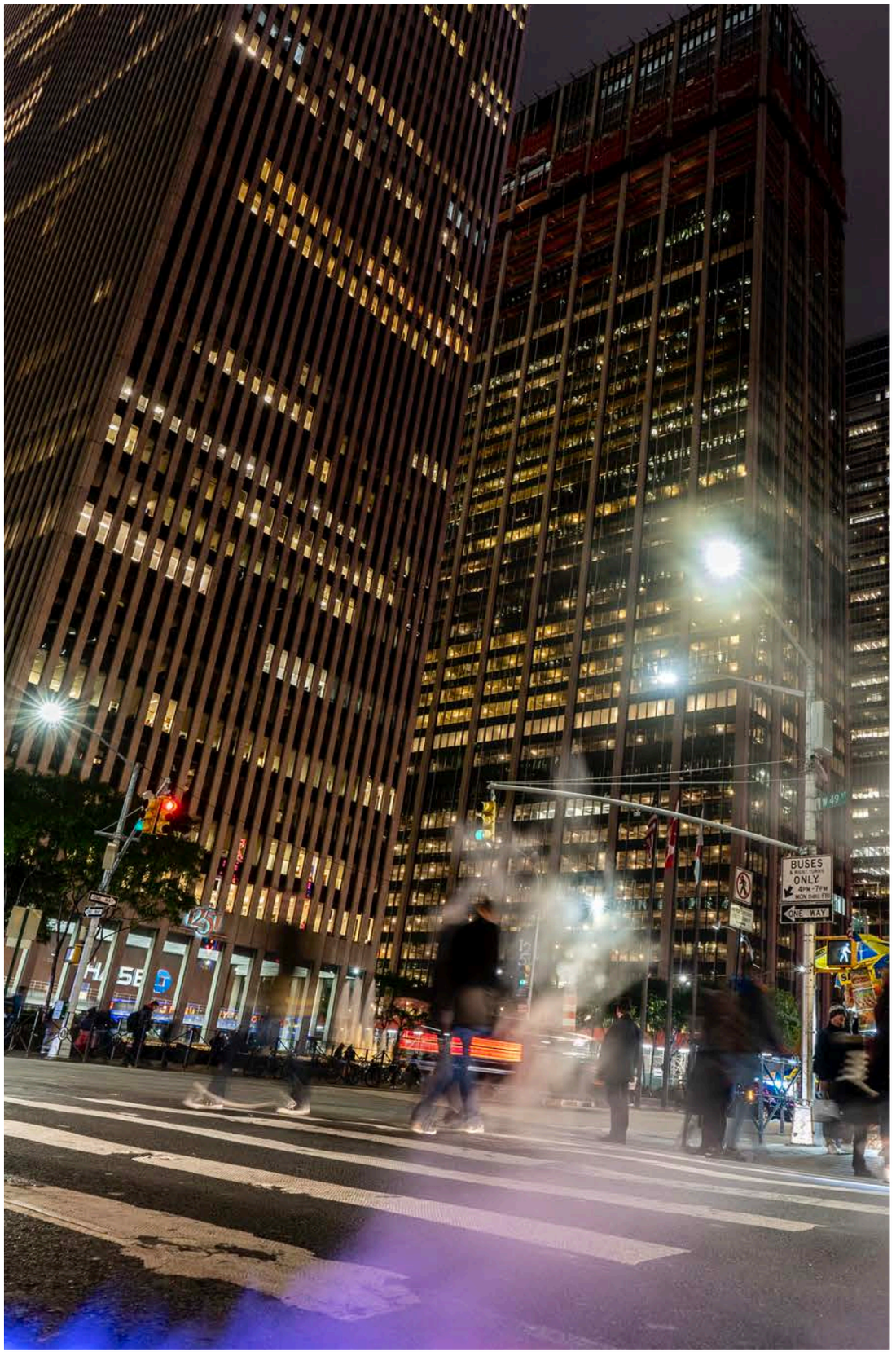




SECTION 3

FIX PERSPECTIVE

There are many factors that can introduce unwanted distortion into a photograph. The two most common are using an incorrect lens and shooting from an extreme angle. The perspective may become distorted. This is easiest to spot in photographs containing continuous vertical lines or geometric shapes.

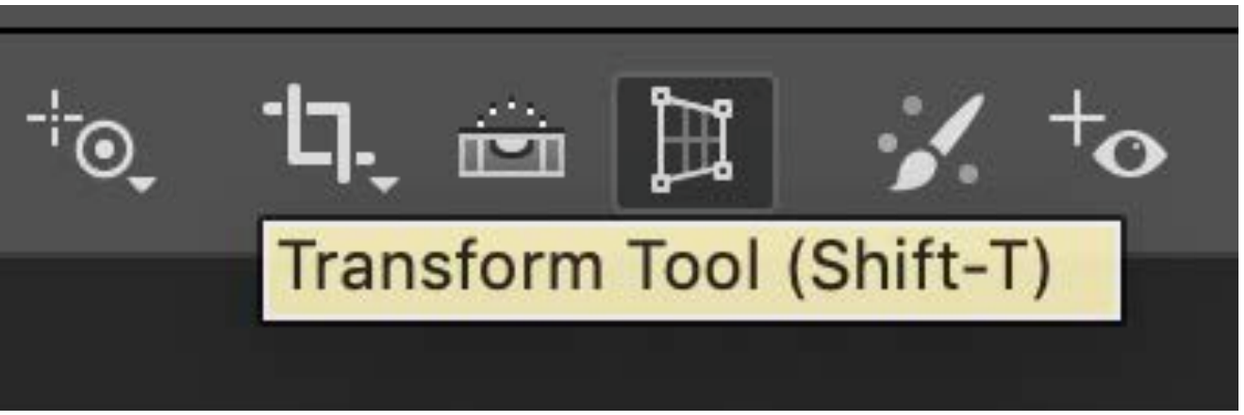


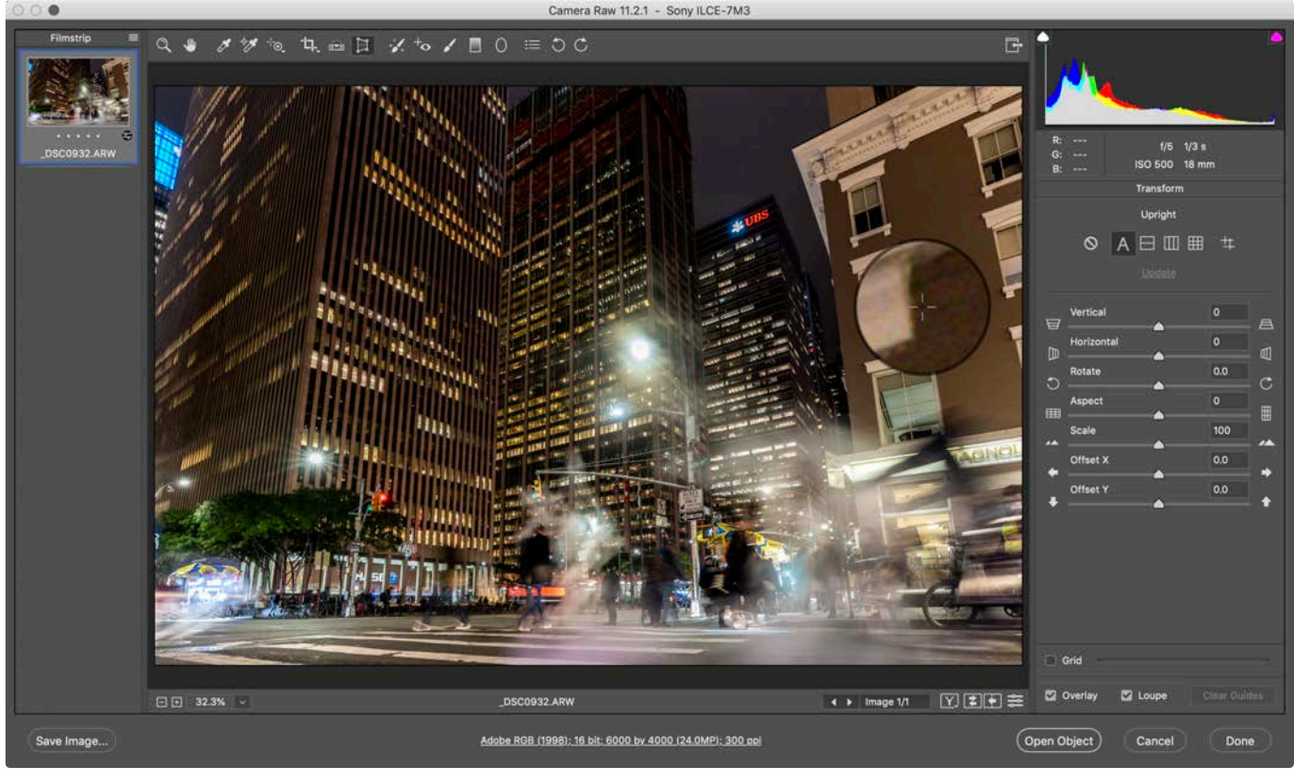
Lens Correction First:
Always apply a lens correction profiles for your camera and lens combination first. These fix several issues and prepare the image to be analyzed better for distortion correction.

Adobe Camera Raw offers the Transform Tool to fix these problems. With four automatic Upright modes — Auto, Level, Vertical, Level, Full — and a Guided mode, it's easy to fix perspective issues.

Let's try fixing a perspective issue with the Upright adjustment.

1. Open a raw file into Adobe Camera Raw.
2. Navigate to the **Lens Corrections** panel. In the **Profile** tab, select the **Enable Lens Profile Corrections** check box.
3. Click the **Transform Tool** in the top toolbar. A new panel opens.





4. In the Transform panel are four automatic Upright modes. Click a mode to apply the correction to the photo.

- **Auto** Applies a balanced set of perspective corrections.
- **Level** Applies perspective correction to ensure that the image is level.
- **Vertical** Applies level and vertical perspective corrections.
- **Full** Applies level, vertical, and horizontal perspective corrections.

5. Cycle through the modes until you find a settings you like.

6. The last mode is **Guided**. It allows you to draw two or more guides on a photo to customize perspective correction.

7. Draw the guides directly on your photo to indicate **horizontal** or **vertical** lines..
   Once you have drawn at least two guides, the photo transforms interactively. You can use up to 4 guides for an image.

8. In addition to auto correction options, you can also manually adjust the perspective of a photo. Use the sliders to fine-tune the perspective corrections.

   - **Vertical**:Tilts the image forward or back in three-dimensional space.
   - **Horizontal**. Tilts the image side to side in three-dimensional space. space.
   - **Rotate**: Rotate freely +/- 10˚.
   - **Aspect**: Stretch the image horizontally or vertically.
   - **Scale**: Enlarge the image overall to avoid transparent pixels.
   - **X Offset:** Shift the image up or down.
   - **Y Offset:** Shift the image left or right..

Experiment Freely:

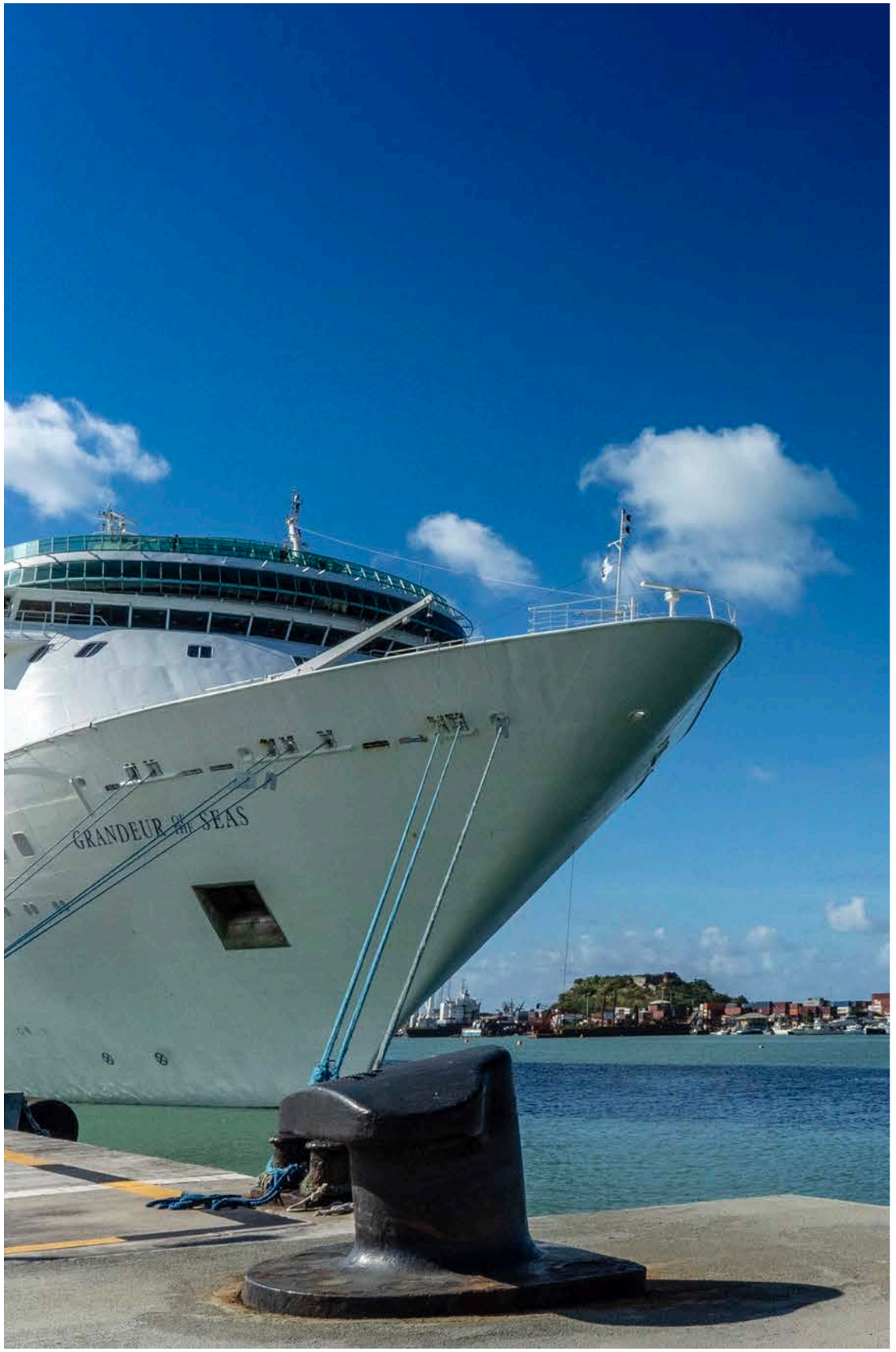
All the five Upright modes are useful under different circumstances. The right method varies image to image and can be affected by your personal taste. Experiment with all five Upright modes before choosing one.

SECTION 4

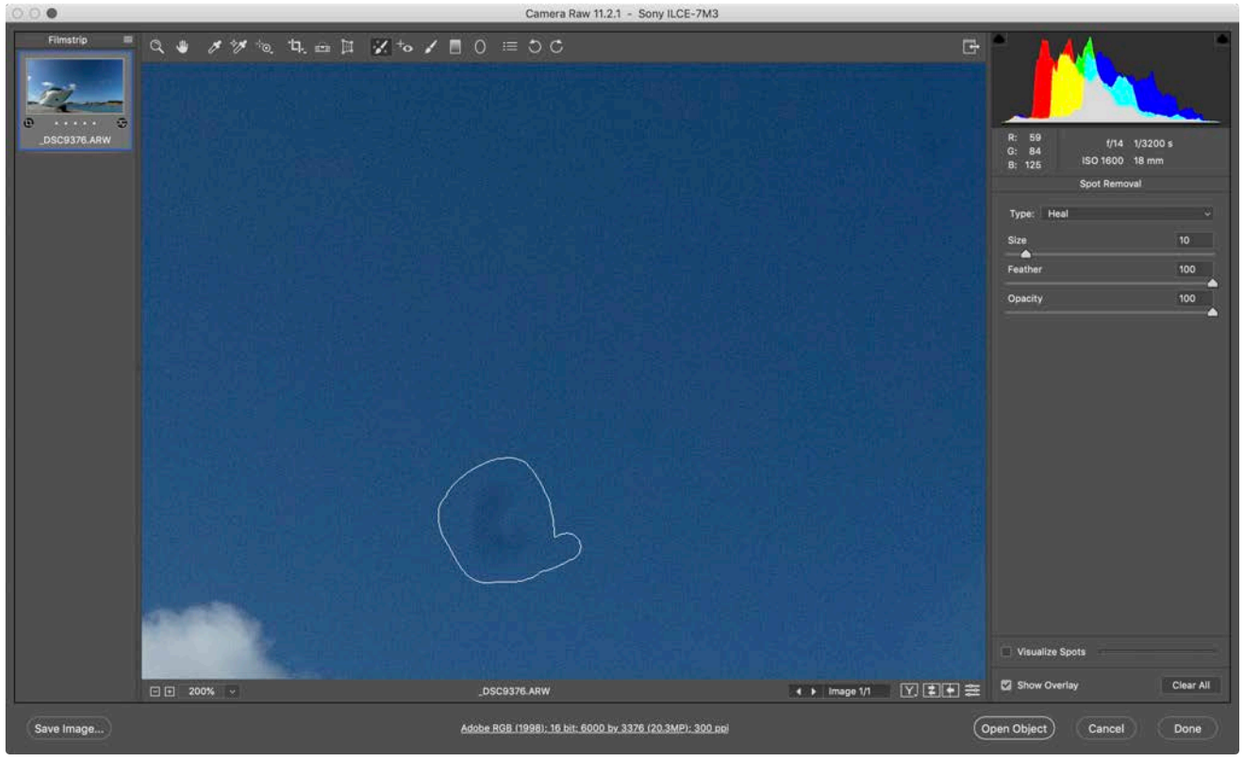
SPOT REMOVAL

The **Spot Removal tool** lets you repair a selected area by sampling pixels from a different area of the same image. The tool is quite useful in that keeps the data as a raw image, allowing the flexibility of further adjustments.

The tool is helpful for removing dust or unwanted details. It is not as robust as the **Healing Brush** or **Content-Aware Fill** commands in Photoshop, but it's still an important tool. It continues to process the raw image data directly. Also, since any edits and modifications to camera raw images are stored in sidecar files, this process is nondestructive.

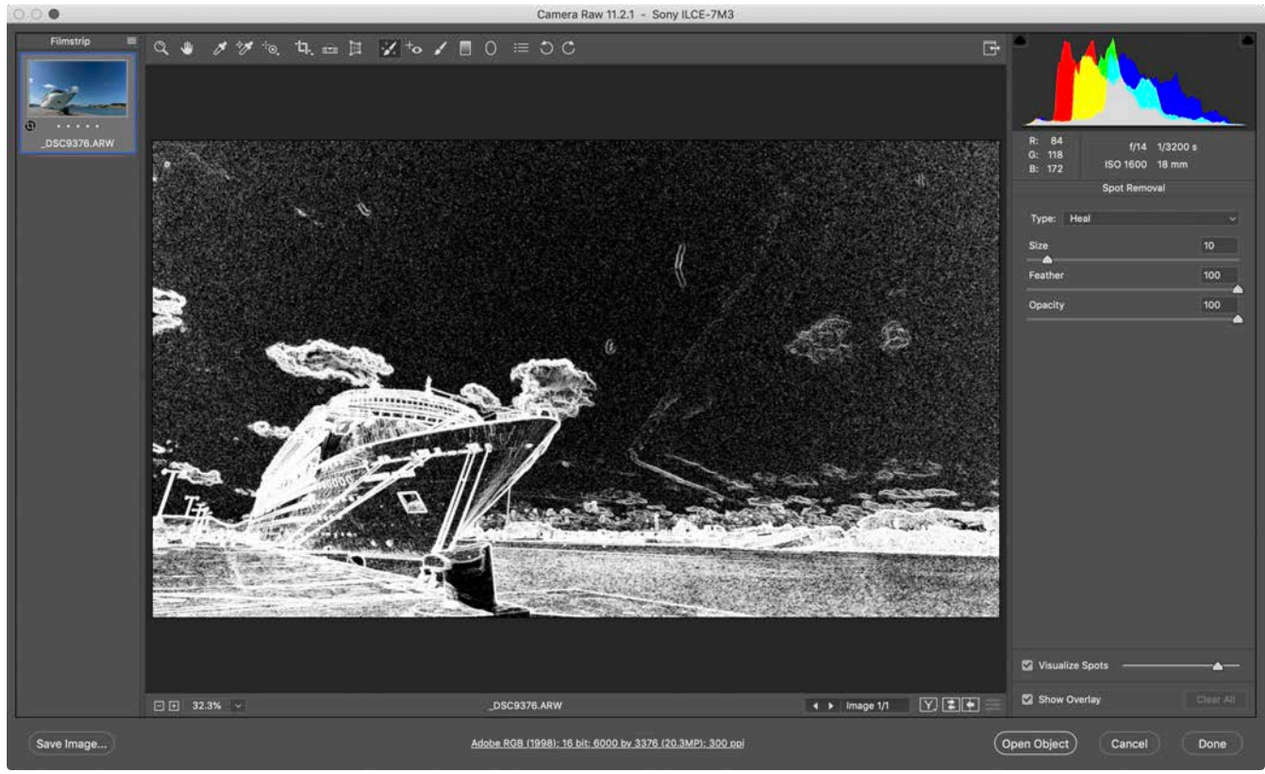


1. Open a camera raw file.
2. Select the **Spot Removal** tool from the toolbar.
3. From the **Type** menu choose a method.
   - **Heal:** Matches the texture, lighting, and shading of the sampled area to the selected area.
   - **Clone:** Applies the sampled area of the image to the selected area.
4. Use the **Size** slider to specify the size of the area the Spot Removal tool affects.
   - **Left bracke**t ([) reduces the tool radius size.
   - **Right bracket** (]) increases the tool radius size.
5. Click and draw on the part of the photo you want to retouch.
   - A red-and-white marquee area (red handle) designates your selection.
   - A green-and-white marquee area (green handle) designates the sampled area.



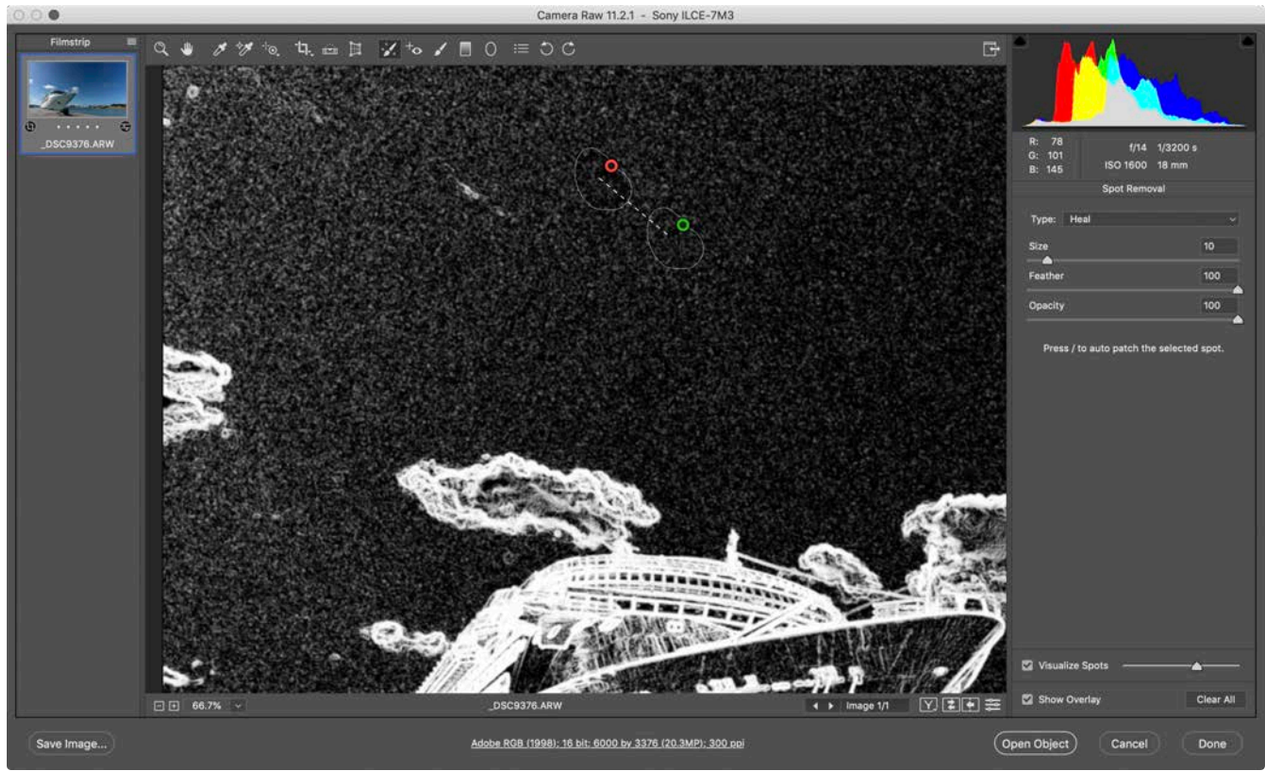
6. If desired, change the sampled area to affect the blended results.

   - **Automatically:** Click the handle of a selected area, and press the **forward slash key (/)**. A new area is sampled. Press the forward slash key until you find a sample area that fits best.
   - **Manually:** Use the green handle to reposition the sampled area.



Visualize Spots:

Are you having a hard time seeing all the dust or spots? Be sure to try out the Visualize Spots option. This feature helps you search for imperfections that may not be immediately visible. Just check the Visualize Spots checkbox (found in the options for the Spot Removal tool). The inverted image makes it easier to see spots. Be sure to adjust the threshold as needed.



SHORTCUTS & MODIFIERS

CIRCULAR SPOT:

- Control/Command + click to create a circular spot; drag to set the source of the spot.
- Command/Control + Option/Alt + click to create a circular spot; drag to set the size of the spot.

RECTANGULAR SELECTION:

- Click Option/Alt + drag to define a rectangular selection. All spots within that selection (highlighted in red) are deleted once the mouse is released.

EXTEND A SELECTED AREA OR SPOT:

- Shift + click to extend an existing selected spot in "connect the dots" fashion.

DELETE A SELECTED AREA OR SPOT:

- Select a red or green handle, and press Delete to delete a selected adjustment.
- Press Option/Alt and click a handle to delete it.

SPOT VISUALIZATION

When the **Spot Visualization** checkbox is selected, to change the visualization threshold:

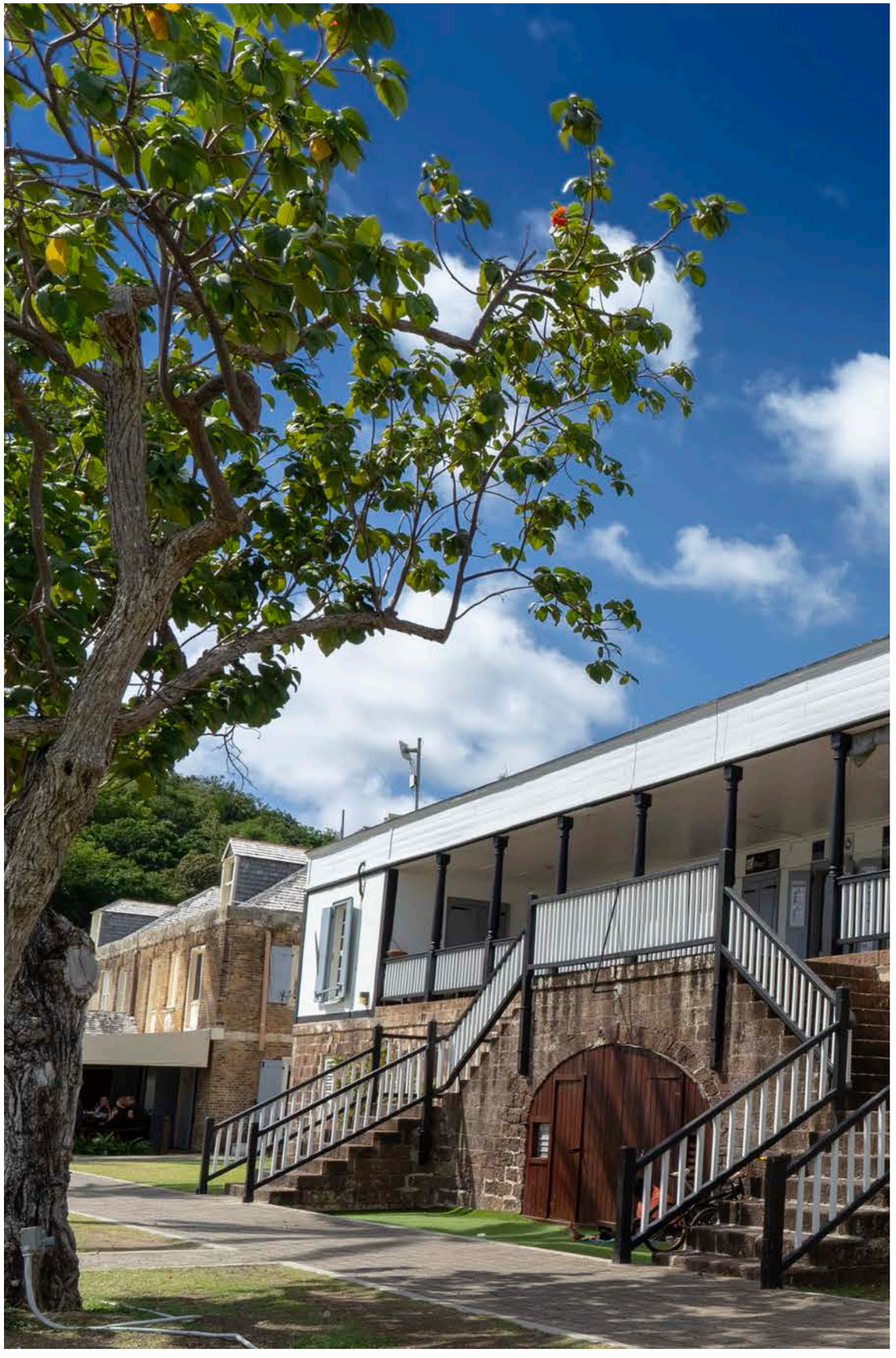
- **Increase:**: Press period (.)
- **Increase (in larger steps):** Press Shift+period (.)
- **Reduce:** Press comma (,)
- **Reduce (in larger steps):** Press Shift+comma (,)

SECTION 5

LOCAL ADJUSTMENTS

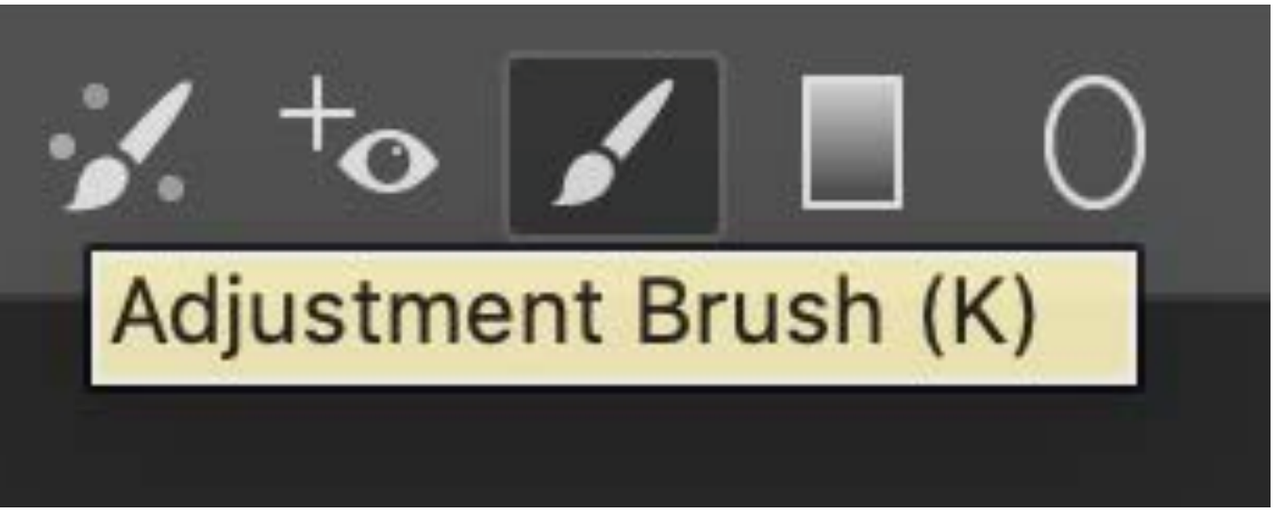
In general, the sliders in Adobe Camera Raw target the entire image (or at least a range within the while photo). But there are a collection if useful tools for creating a more targeted adjustment to a specific area of a photo.

You can use the **Adjustment Brush** tool , the **Graduated Filter** tool , or the **Radial Filter** tool in Camera Raw. These offer far more localized adjustments.



MAKING LOCAL ADJUSTMENTS

Getting local adjustments "right" will take some experimentation. You should choose a tool and specify its options before you paint or draw. You then paint or drag to add an adjustment to the image. Then you can go back and edit that adjustment, or apply a new one. All adjustments are added nondestructively to the image.



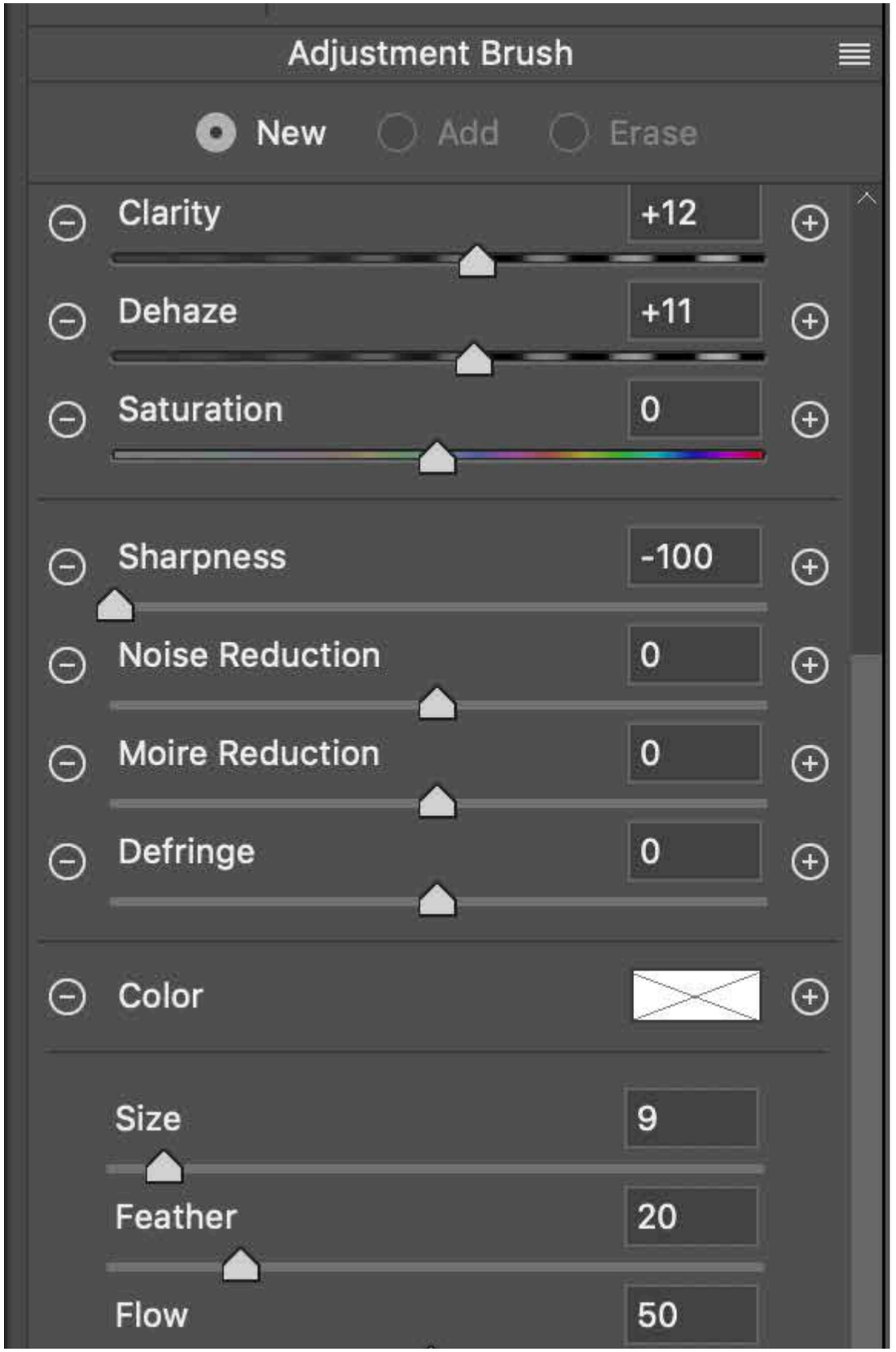
CHOOSING THE RIGHT TOOL

There are three local adjustment tools to select from. You can use one, two or all three in an image. Additionally you can use multiple instances of a tool depending upon the complexity of the photo.

- With the **Adjustment Brush** tool, you can selectively apply Exposure, Brightness, Clarity, and other adjustments by "painting" them onto the photo.
- With the **Graduated Filte**r tool, you can apply the same types of adjustments gradually across a region of a photo with a gradient. You can make the region as wide or as narrow as you like to control the transition of the effect.
- With the **Radial Filter** tool, you can draw an elliptical area around the subject. You can set the ellipse to apply adjustments to either outside or inside the selected area.

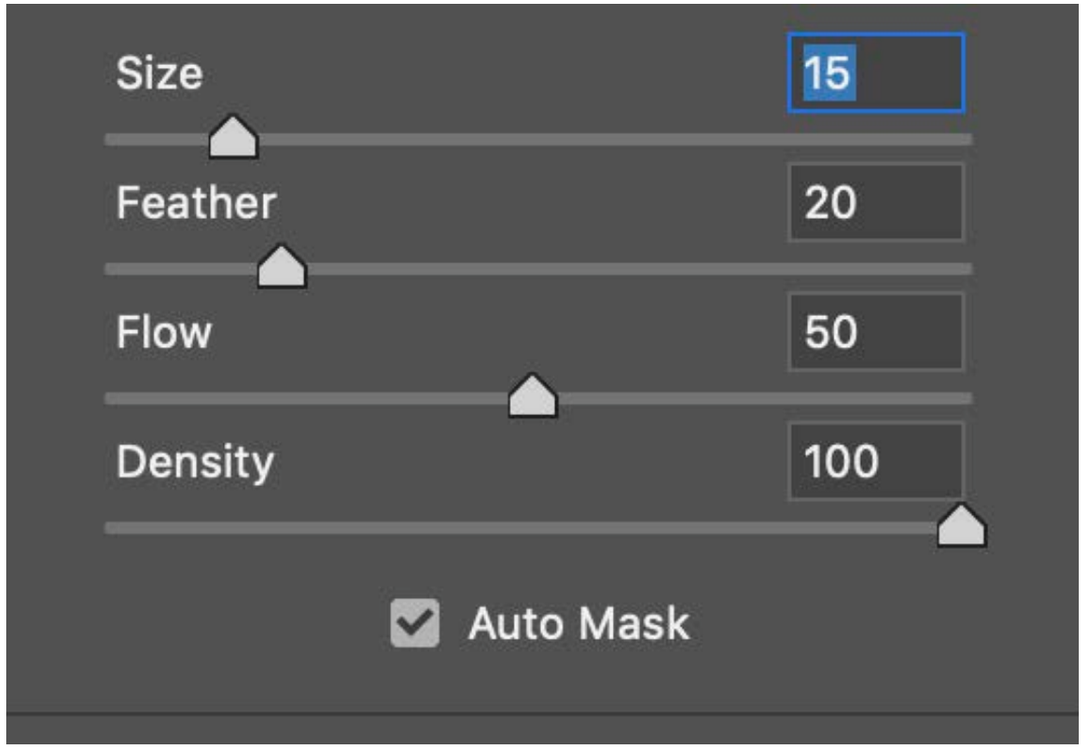
MAKING A LOCAL ADJUSTMENT

1. Select the Adjustment Brush tool from the toolbar.
2. Explore the options in the side panel.
3. Choose the type of adjustment you want to make by dragging an effects slider.
   - **Temp**: Adjusts the color temperature of an area of the image, making it warmer or cooler.
   - **Tint**: Compensates for a green or magenta cast.
   - **Exposure**: Sets the overall image brightness. Applying an Exposure local correction can achieve results similar to traditional dodging and burning. When combined with a graduated filter, it also makes a nice refinement for skies or shadows.
   - **Highlights**: Recovers detail in overexposed highlight areas of an image.
   - **Shadows**: Recovers detail in underexposed shadow areas of an image.
   - **Whites**: Adjusts the white points in a photo
   - **Blacks**: Adjusts the black points in a photo



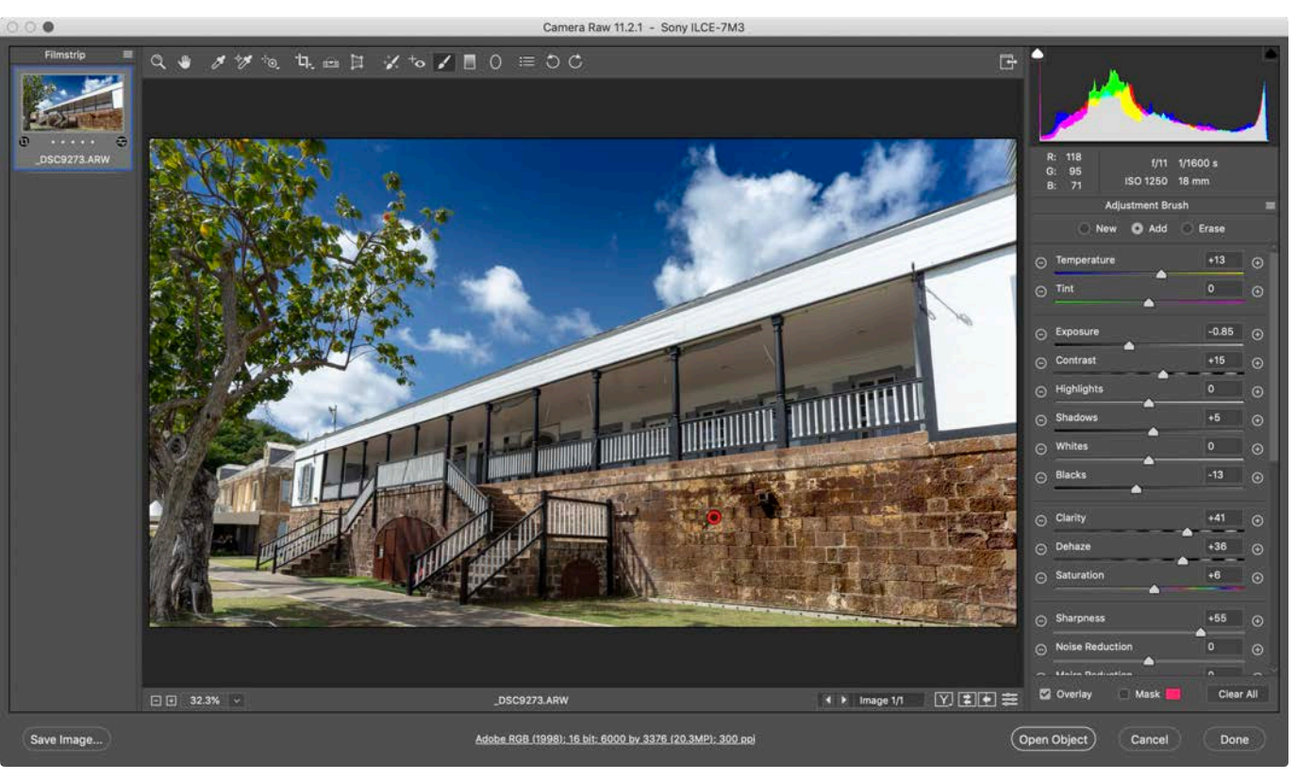
- **Brightness**: Adjusts the image brightness, with a greater effect in the midtones.
- **Contrast**: With the Adjustment Brush or Radial/ Graduated Filter tools, you can selectively apply Exposure, Brightness, Clarity, and other adjustments by "painting" them onto the photo.
- **Saturation**: Changes the vividness or purity of the color.
- **Clarity**: Adds depth to an image by increasing local contrast.
- **Dehaze**: Reduces or increases existing haze.
- **Sharpness:** Increases edge details.
- **Noise Reduction:** Reduces luminance noise, which can become apparent when shadow areas are opened.
- **Moiré Reduction:** Removes artifacts or color aliasing.
- **Defringe:** Removes unwanted color fringing..
- **Color:** Applies a tint to the selected area. Select the hue by clicking the color sample box.

4. Specify brush options as desired.
   - **Size**: Specifies the diameter of the brush tip.
   - **Feather**: Controls the softness of the brush stroke.
   - **Flow**: How quickly the adjustment is applied with each stroke.
   - **Density**: Controls the amount of transparency in the stroke.
   - **Auto Mask:** Confines brush strokes based on edge detection.
   - **Show Mask:** Toggles visibility of the mask overlay in the image preview.



5. Paint with the Adjustment Brush tool.
   - The cross hair indicates the application point.
   - The solid circle indicates the brush size.
   - The black-and-white dashed circle indicates the feather amount.
   - Use the **Auto Mask** option to detect edges and further limit strokes.

6. When you release the mouse, a pin icon is added to indicate the application point. In the Adjustment Brush tool options, the mask mode changes to **Add**.

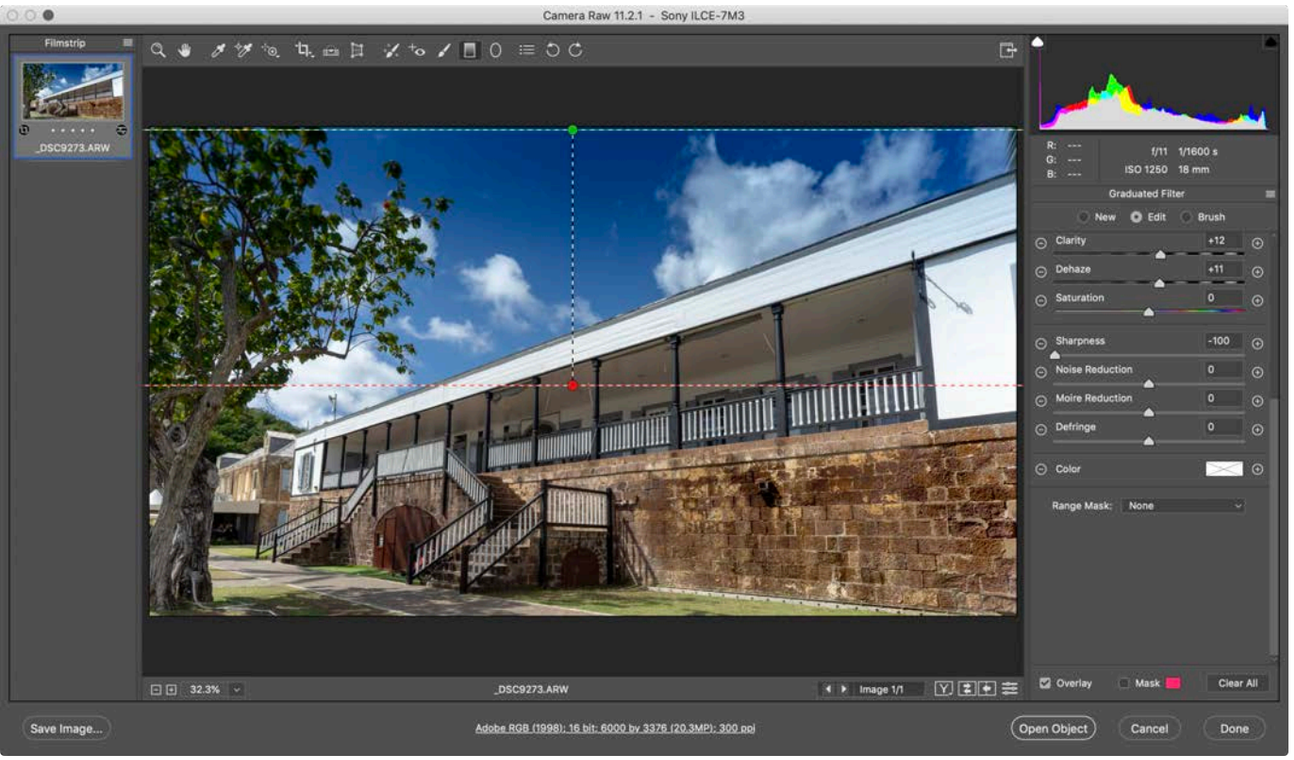


7. You can refine the effects of the area created by the brush after it is added by using the effect sliders
   - Press the **V** key to hide or show the pin icons.
   - To toggle visibility of the mask overlay, press the **Y** key, or position the mouse pointer over the pin.
   - To undo part of the adjustment, click **Erase** in the Adjustment Brush tool options and paint over the adjustment's mask to remove from the strokes.
   - Remove the adjustment completely by choosing the pin and pressing the Delete key.
   - Press Cmd+Z (Ctrl+Z) to undo your last adjustment.
   - Click **Clear All** at the bottom of the tool options to remove all Adjustment Brush tool adjustments and set the mask mode to New.

Multiple Strokes:
When working with multiple Adjustment Brush adjustments, make sure you're in Add mode to switch between them. Click a pin icon to select that adjustment and refine it.

THE GRADUATED FILTER TOOL

1. Open a photo in Adobe Camera Raw.
2. Select the **Graduated Filter** tool from the toolbar (or press G).
   Camera Raw opens the Graduated Filter tool options under the Histogram and sets the mask mode to New.
3. Choose the type of adjustments you want to make in the Graduated Filter tool options by using the related sliders.



4. Click and drag in the photo to apply a graduated filter across a region of the photo.
   A common application is to drag from top to bottom to adjust the sky.
5. Refine the filter by doing any of the following:
   - Drag any of the effect sliders in the Graduated Filter tool options to customize it.
   - Toggle **visibility** of the guide overlays by selecting the **Overlay** option (or press **V**).
   - Drag the green or red dot to freely position or rotate the effect. Hold the Shift key to constrain the effect.
   - Drag the black-and-white dotted line to shift the effect as a whole.
   - Position the pointer over the green-and-white or red-and-white dotted line, near the green or red dot, until a double-pointing arrow appears. Then, drag to expand or contract the effect at that end of the selected range.
   - Remove the filter by pressing Delete.
   - Press Cmd+Z (Ctrl+Z) to undo your last adjustment.
   - Click **Clear All** at the bottom of the tool options to remove all Graduated Filter tool effects and set the mask mode to New.
6. Use the Effect sliders to taste. They are identical to the Adjustment Brush options covered earlier in the chapter.

THE RADIAL FILTER TOOL

A useful way to control where a viewer's attention is drawn to within a photo is to add a vignette effect. With the Radial Filer tool, these can be custom drawn and do not need to be centered. Additional effects can also be added for a refined look

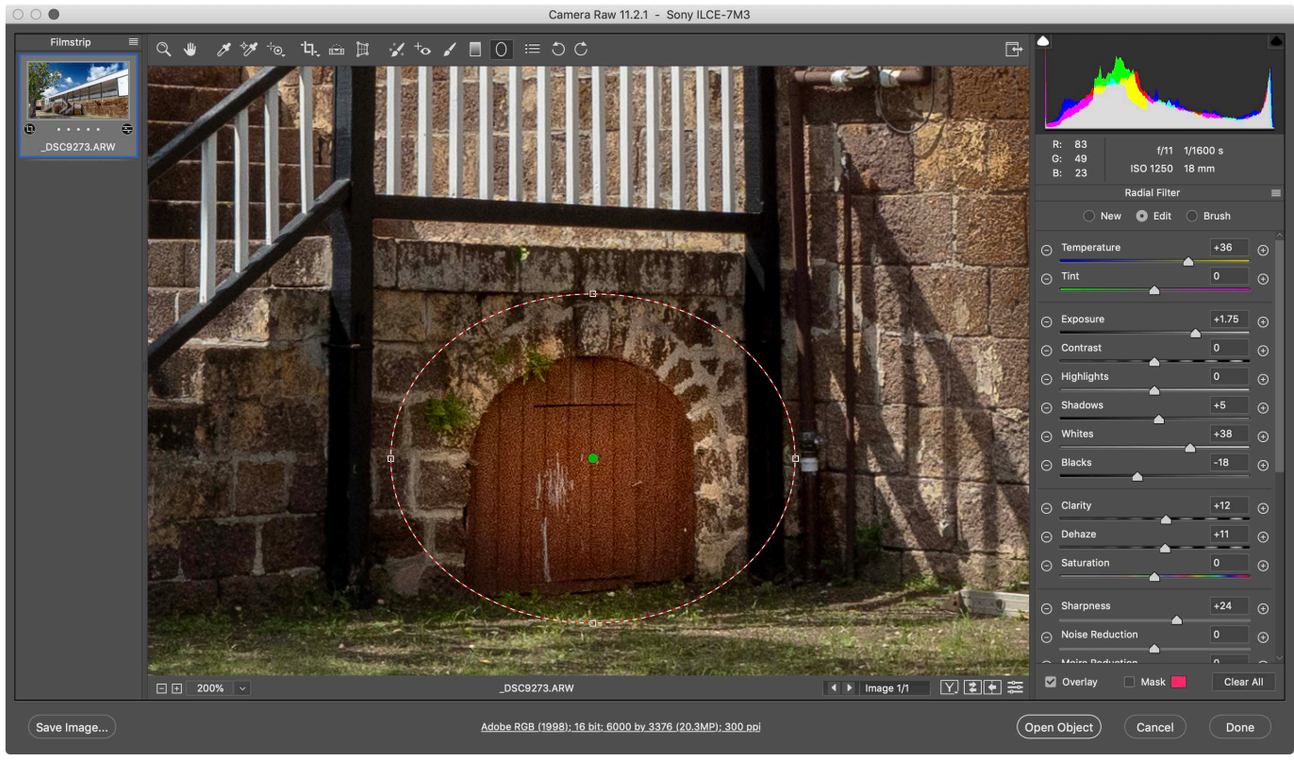
1. Open a photo in Adobe Camera Raw.

2. Select the **Radial Filte**r tool from the toolbar (or press **J**).
   Camera Raw opens the Radial Filter tool options under the Histogram and sets the mask mode to New.

3. Choose the type of adjustments you want to make in the Radial Filter tool options by using the related sliders.

4. Click and drag in the photo to apply a graduated filter across a region of the photo and draw a circular or elliptical shape. This shape determines the area affected by or excluded from the adjustments.

5. Choose what area of the photo is modified with an Effect option (located below the sliders).
   - **Outside**: All modifications are applied outside the selected area.
   - **Inside**: All modifications are applied to the selected area.



6. Adjust the size (width and height) and orientation of the Radial filter added. Click and drag the center of the filter to move and reposition it.
   - Hover the pointer over any of the four filter handles, then click and drag to change the size of the filter.
   - Hover the pointer close to the edge of the filter, the cursor changes to a curved two-headed arrow. Then click and drag to rotate the the filter boundaries.then click and drag the edge of the filter to change its orientation.
   - Remove the filter by pressing **Delete**.
   - Press Cmd+Z (Ctrl+Z) to undo your last adjustment.
   - Click **Clear All** at the bottom of the tool options to remove all Graduated Filter tool effects and set the mask mode to **New**.

7. Use the **Effect** sliders to taste. They are identical to the Adjustment Brush options covered earlier in the chapter.

REFINE ADJUSTMENTS WITH MASKS

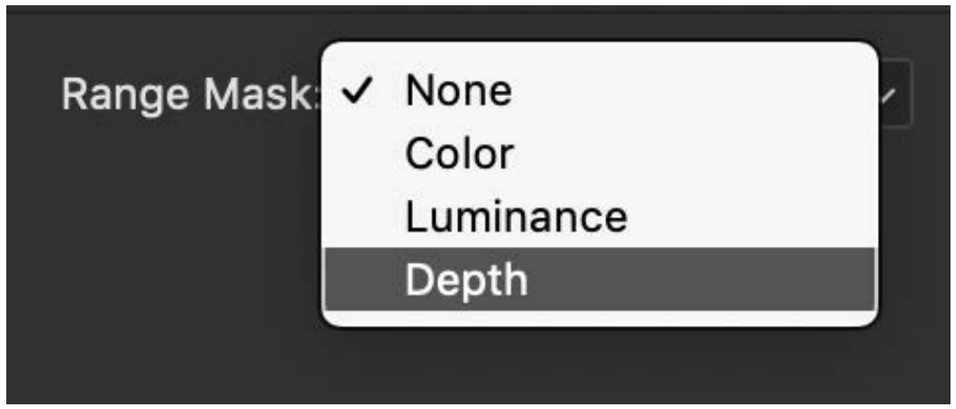
Adobe Camera Raw can restrict any of the local adjustments by using a Color, Luminance, or Depth Range Mask. Each allows you to further refine the application of an effect based on an image property.

DEPTH RANGE MASK

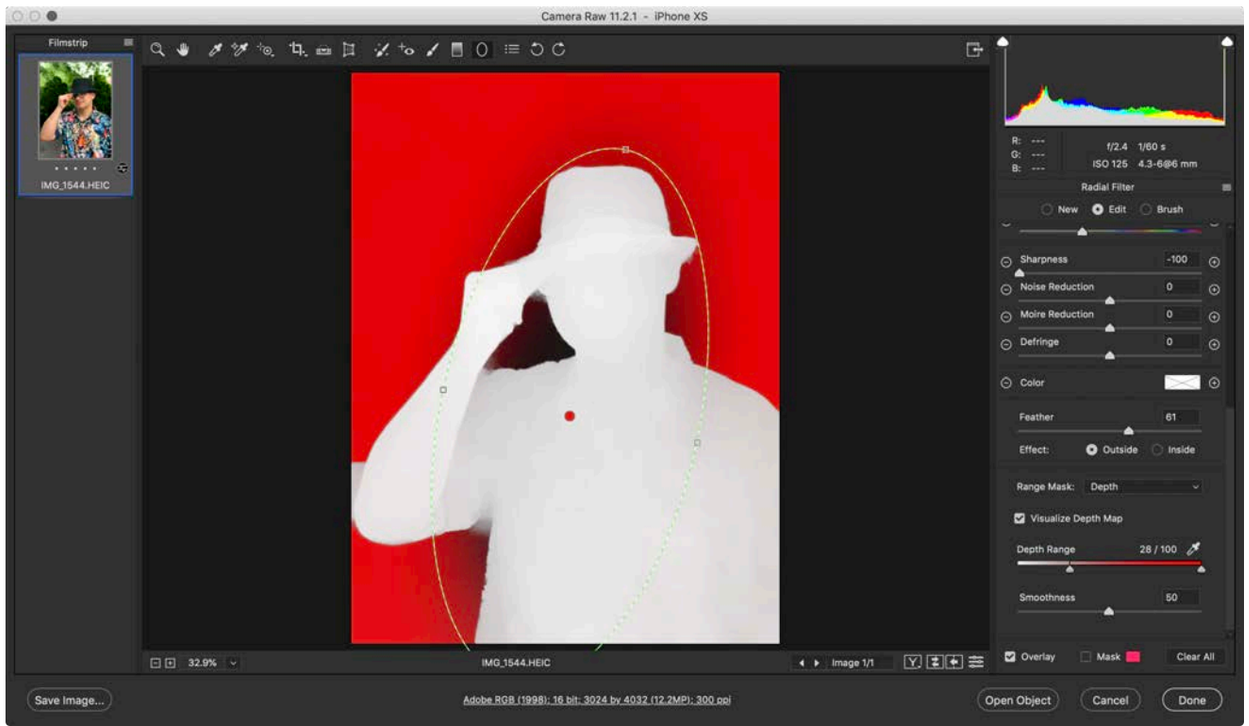
A depth range mask is only available only for photos that have embedded depth map information. This includes photos such as those captured in the HEIC format on an Apple iPhone using Portrait mode. In order to view this information, you'll need to open the HEIC file directly using Adobe Camera Raw.

1. Launch **Adobe Bridge** by choosing File > Browse in Bridge from Adobe Photoshop.
2. Navigate to the desired **HEIC** file and then right-click on it.
3. Choose **Open in Camera Raw**.
4. In the toolbar of the Camera Raw dialog box, select the Adjustment Brush tool, Graduated Filter tool, or Radial Filter tool.
5. Create an initial selection mask over a specific area of your photo that you want to correct.

6. From the tool options in the Adjustment panel on the right, choose the Range Mask type as **Depth** from the drop-down list.



7. Select the **Visualize Depth Map** check box to view the depth information of the photo in black and white representation. This makes it easier to determine which areas are affected and which are ignored.

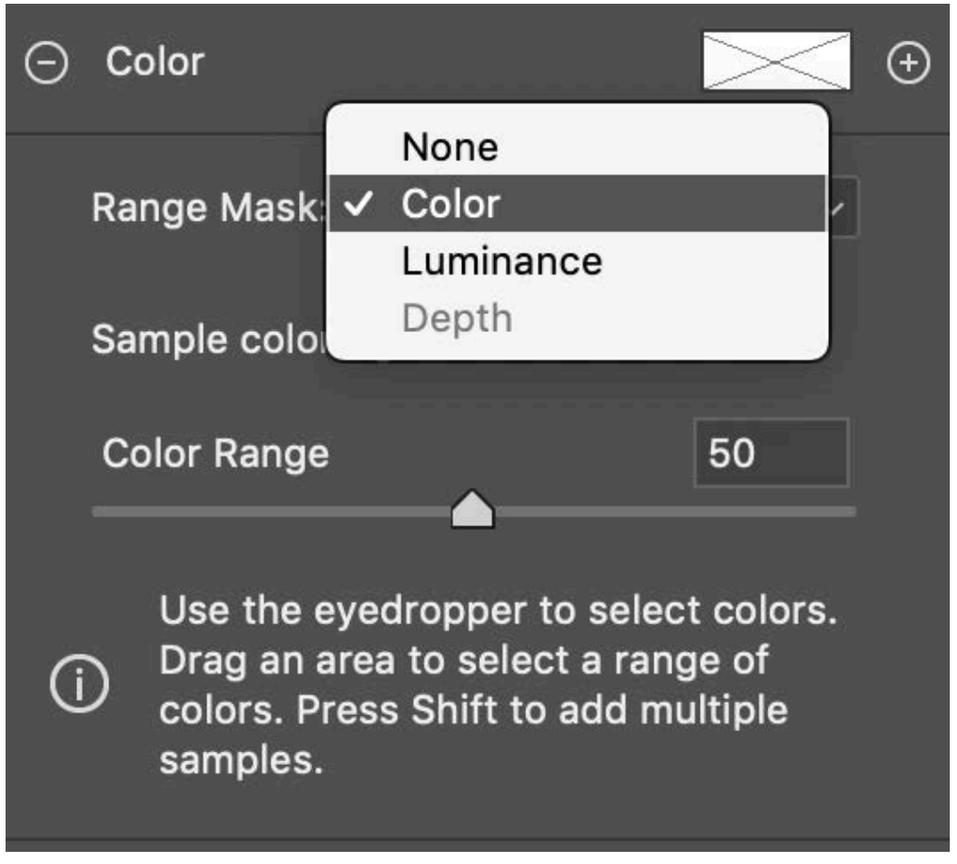


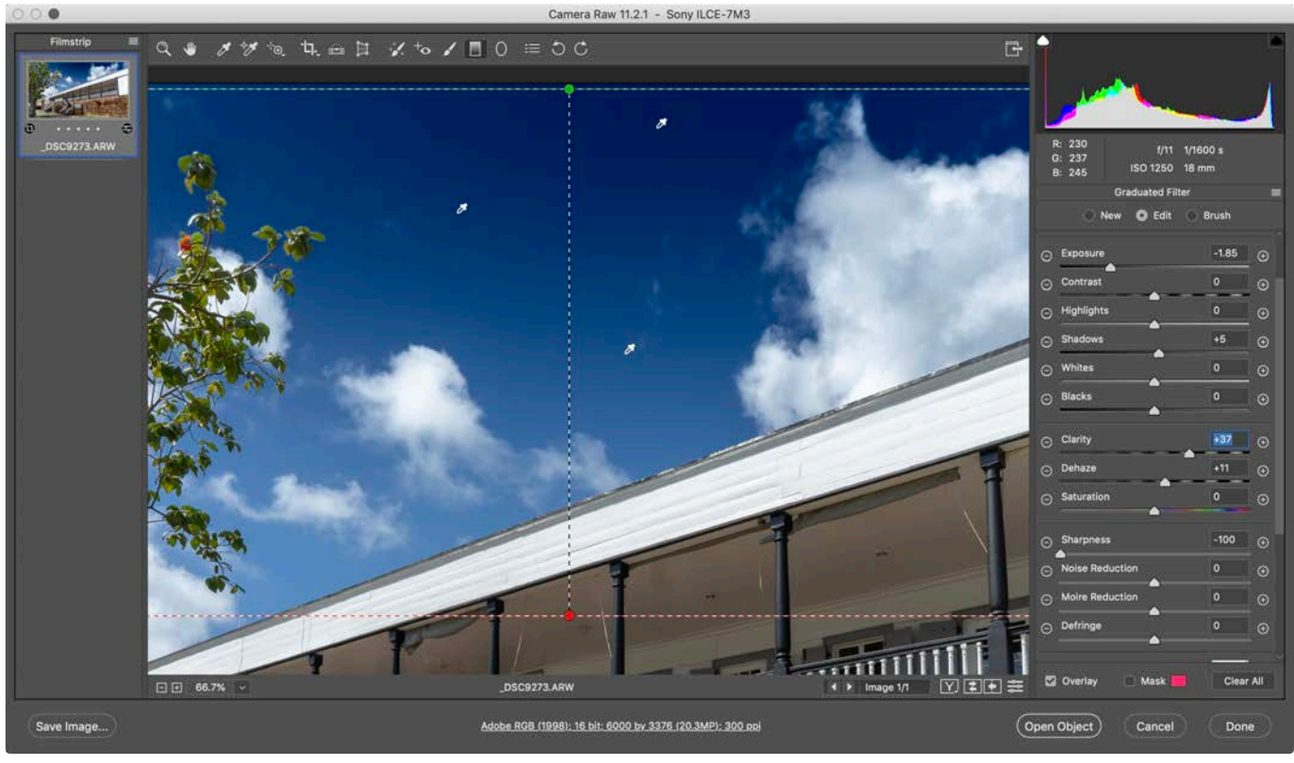
8. Select a depth range within the mask area:
9. Adjust the **Depth Range** slider to set the endpoints of the selected depth range.
10. Use the **Smoothness** slider to adjust the smoothness of the falloff at either end of the selected depth range.
11. Deselect the Visualize Depth Map check box and refine the adjustment to taste.

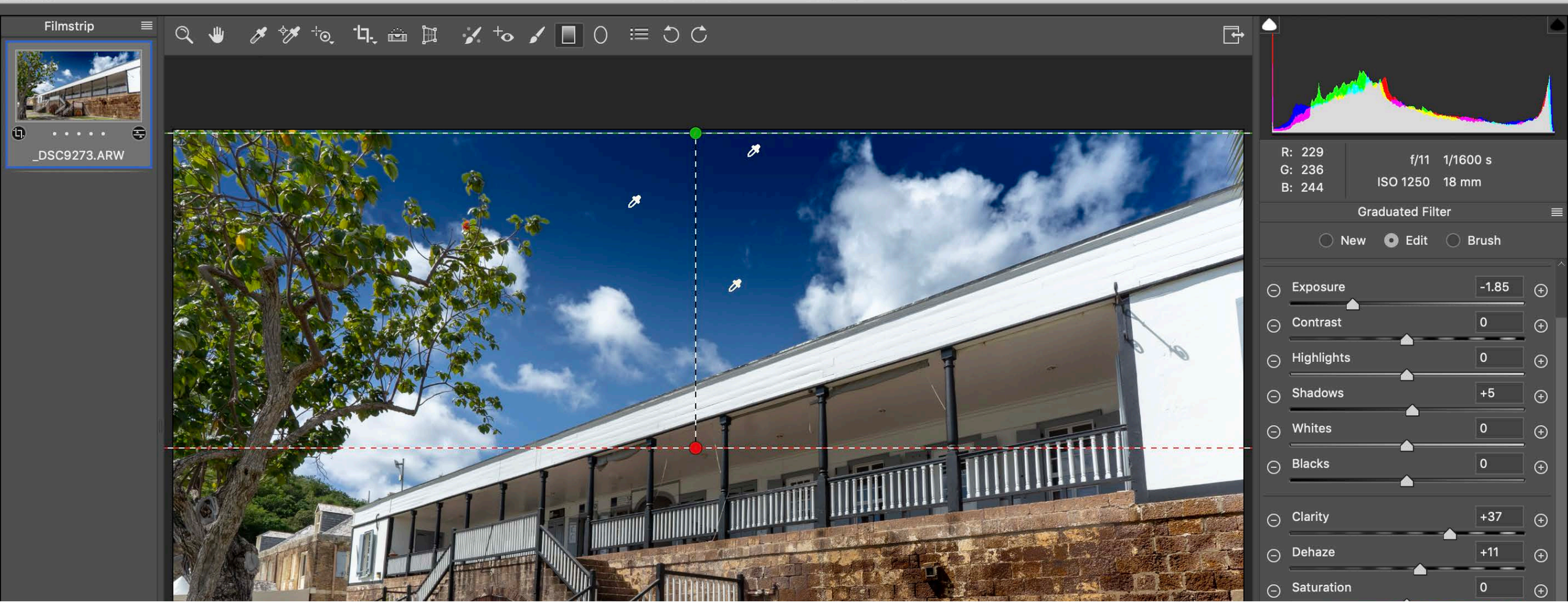
COLOR RANGE MASK

After making an initial selection mask in a photo, you can further target its results with a selection mask based on the colors that you sample within the mask area.

1. Open a photo in Adobe Camera Raw.
2. Use the **Radial Filter** tool, **Graduated Filter** tool, or **Adjustment Brush** tool to create an initial selection.
3. From the tool options in the Adjustment panel on the right, choose the Range Mask type as **Color** from the drop-down list.
4. Use the eyedropper (near the Range Mask option) to sample a color within the mask area to limit the effect. Do any of the following:
   - To sample a single color within the mask area, click the eyedropper at the desired location.
   - For more accurate color selection, click+drag an area around the colors that you want to adjust.
   - To sample colors from multiple selections, hold the **Shift** key while selecting a single color (Shift+click) or while selecting an area (Shift+click+drag). You can add up to **five** color samples.







5. Adjust the **Color Range** slider to narrow or broaden the range of selected colors.

6. To exit color sampling, press the **Esc** key or click the eyedropper (near the Range Mask option).

7. Use the sliders for the effect to make targeted adjustments based on the selected color or color ranges.

LUMINANCE RANGE MASK

After making an initial selection mask in a photo, you can further target its results with a selection mask based on a brightness range that you sample within the mask area.

1. Open a photo in Adobe Camera Raw.
2. Use the **Radial Filter** tool, **Graduated Filter** tool, or **Adjustment Brush** tool to create an initial selection.
3. From the tool options in the Adjustment panel on the right, choose the Range Mask type as Luminance from the drop-down list.
4. Use the sliders or eyedropper (near the Range Mask option) to choose a luminance range within the mask area to limit the effect. Do any of the following:
   - Drag the sliders to set a range based on light and dark areas.
   - Click+drag an area around the range in the photo that you want to adjust.
   - Use the Smoothness slider to adjust how smooth the falloff is at either end of the luminance range.
5. Select the **Visualize Luminance Map** check box to view the luminance information of the photo in black and white representation.
   The part in red color shows the actual area masked.
6. Refine the mask as needed with the sliders, then uncheck the Visualize Luminance Map check box.
7. Use the sliders for the effect to make targeted adjustments based on the selected luminance range.

SHORTCUTS & MODIFIERS

NEW RADIAL FILTER ADJUSTMENTS:

- Press and hold Shift while dragging to create an adjustment that is constrained to a circle.
- While dragging, press and hold the spacebar to move the ellipse; release the spacebar to resume defining the shape of the new adjustment.

EDITING ADJUSTMENTS:

- While dragging inside an adjustment to move it, press and hold Shift to constrain the movement in the horizontal or vertical direction.
- While dragging one of the four handles to resize an adjustment, press and hold Shift to preserve the aspect ratio of the adjustment shape.
- While dragging the boundary of an adjustment to rotate it, press and hold Shift to snap the rotation to 15-degree increments.
- While an adjustment is selected, press X to flip the effect direction (for example, from outside to inside).

DELETING ADJUSTMENTS:

- While an adjustment pin is selected, press Delete to delete the adjustment.
- Press Option/Alt + click an existing adjustment to delete it.
- Adjustments with maximum coverage
- Press Command/Control and double-click an empty area to create an adjustment that is centered and covers the cropped image area.
- Press Command/Control and double-click within an existing adjustment to expand that adjustment to cover the cropped image area.

SECTION 6

KEYBOARD **SHORTCUTS**

Result	Windows	macOS
Zoom in	Control + (+)	Command + (+)
Zoom out	Control + (-)	Command + (-)
Zoom to 100%	Control + Alt + 0	Command + Option + 0
Zoom to fit	Control + 0	Command + 0
Step back through Edit history	Control + Z	Command + Z
Undo	Control + Alt + Z	Command + Option + Z
Redo	Control + Shift	Command + Shift
Preferences	Control + K	Command + K

Result	Windows	macOS
Select all images	Control + A	Command + A
Select all rated images	Control + Alt + A	Command + Alt + A
Select only main image	Control + D	Command + D
Synchronize selected images	Alt + S	Option + S
Synchronize selected images with no dialog	Alt + Shift + S	Option + Shift + S
Merge selected images to a panorama	Control + M	Command + M
Merge selected images to HDR	Alt + M	Option + M
Merge selected images to a panorama (no dialog)	Control + Shift + M	Command + Shift + M
Merge selected images to HDR (no dialog)	Alt + Shift + M	Opt + Shift + M
Rotate image right (clockwise)	Control +]	Command +]
Rotate image left (counterclockwise)	Control + [	Command + [
Mark image as rejected	Alt + Backspace	Option + Delete

Result	Windows	macOS
Open image	Control + O	Command + O
Open image copy	Control + Alt + O	Command + Option + O
Open as smart object	Control + Shift + O	Command + Shift + O
Save image	Control + S	Command + S
Save image without dialog	Control + Alt + S	Command + Alt + S
Apply auto adjustments	Control + U	Command + U
Apply default adjustments	Control + R	Command + R
Decrease current brush size	[	[
Increase current brush size	]	]
Toggle brush overlay	V	V

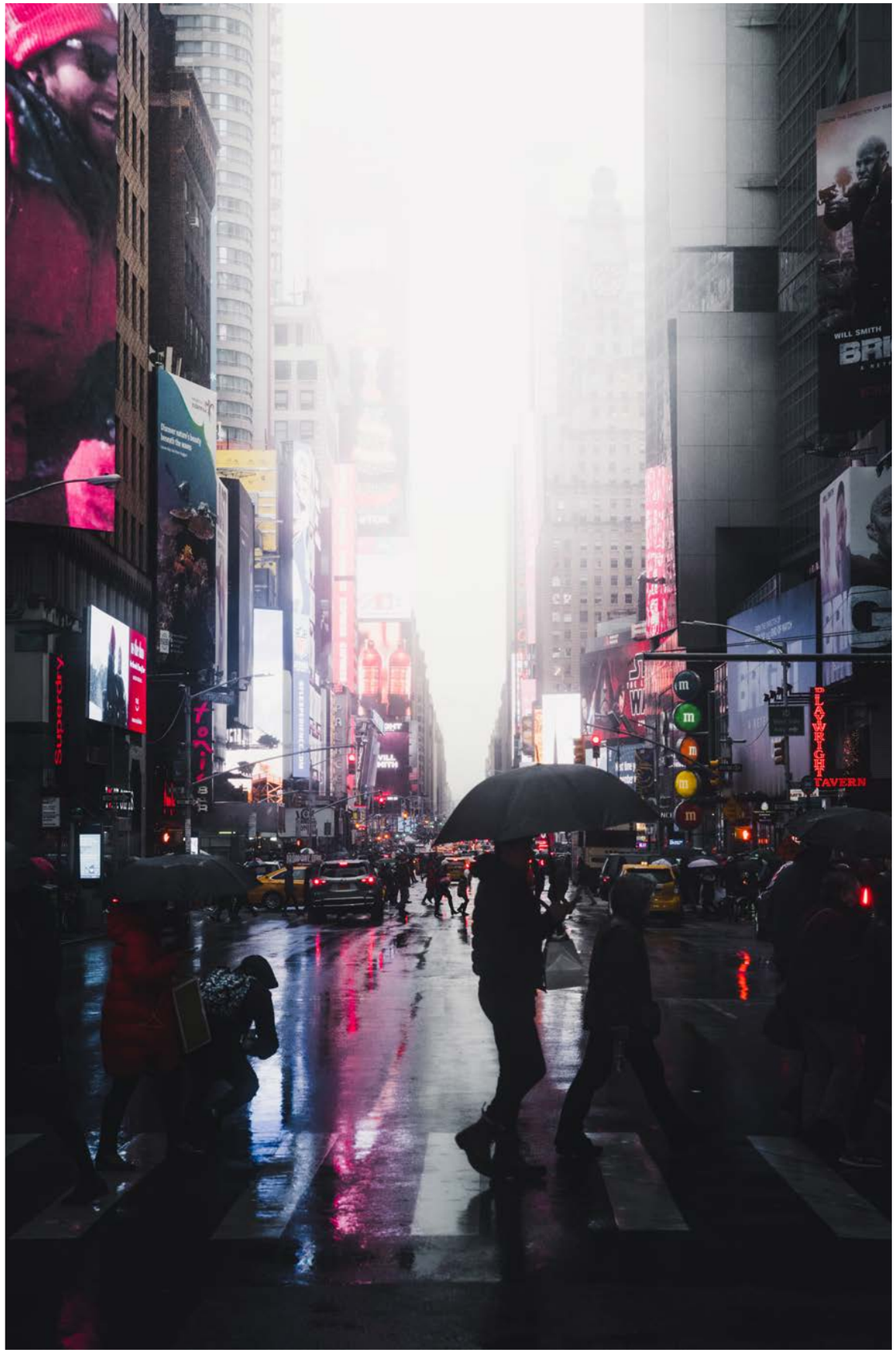
CHAPTER 4

HDR SHORTCUTS

Adobe Camera Raw is a very versatile application. Besides the ability to develop photos it can also create new types of images like **panoramic** and **HDR** images made from multiple source images. It can also convert file types and backup your work to a new file.

More than Raw Files

You can in fact open TIFF and JPEG files using the Camera Raw plug-in. You need to switch to Adobe Bridge and select the desired files. Then choose File > Open In Camera Raw. You won't see any major benefits to image quality, but you can use the Camera Raw dialog box to adjust the images.



© Luke Stackpoole

SECTION 1

PANORAMIC IMAGES

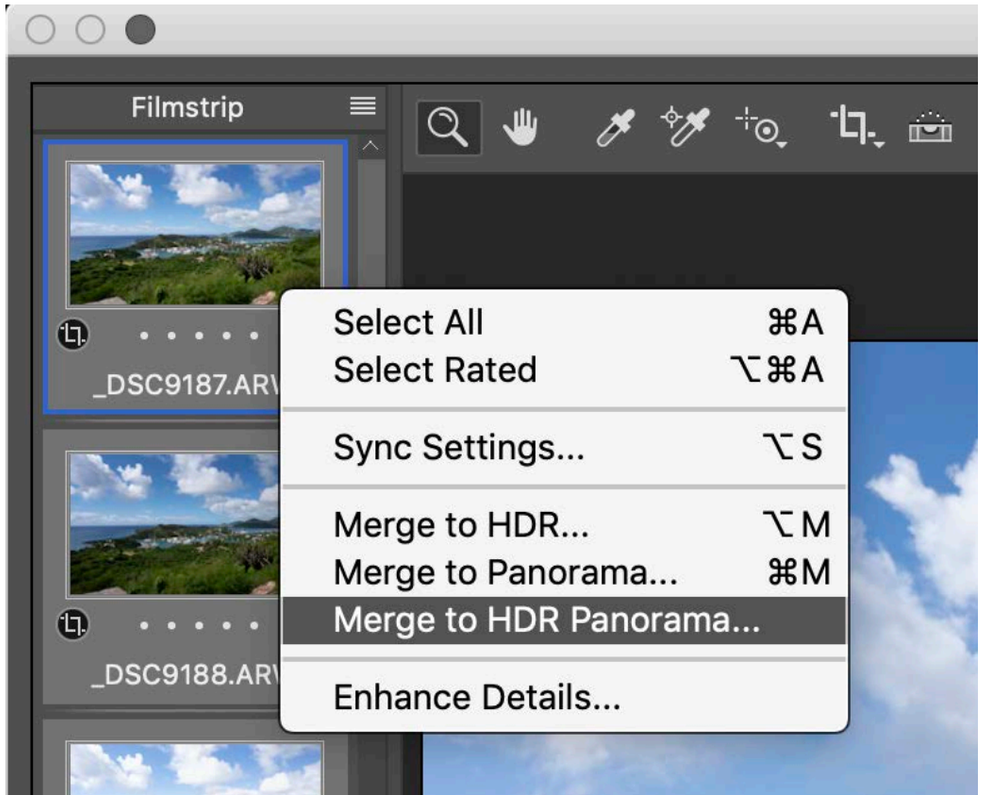
With Adobe Camera Raw, you can merge multiple raw files from a panoramic sequence into a new DNG image. This new panorama composite preserves all of the flexibility of a raw file which leads to a huge boost in editing flexibility. This feature works with both traditional panoramic as well as multi-bracketed HDR panoramic photos.

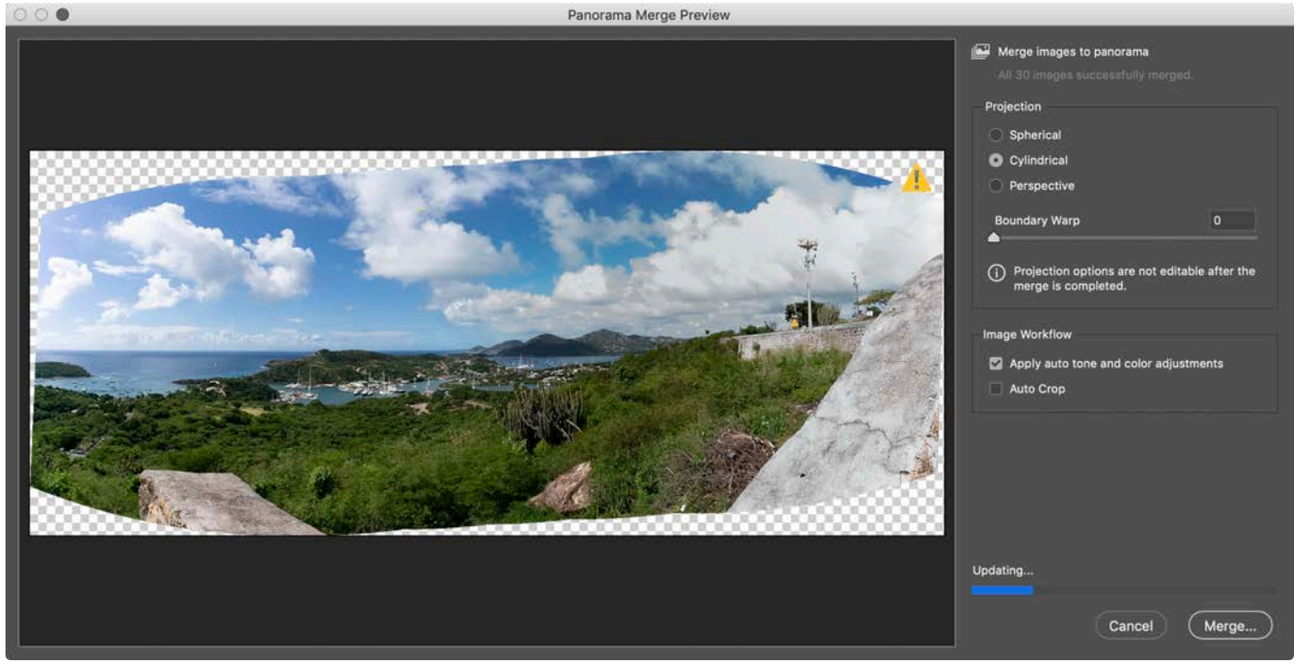
© Isis França

Better Stitching

For the best results when merging panoramic images have at least a 25% overlap between shots. Shooting a vertical image also leads to less distortion.

1. .Choose File > Open and select multiple raw or DNG source images.
2. In the Camera Raw dialog box, select the images that you want to merge in the **Filmstrip** panel. To select all images press Command+A (Ctrl+A) or use the Shift key to select a range if images.
3. Right-click on an image in the panel and choose one of the following:
   - For standard exposure photos, select **Merge to Panorama.**
   - For exposure bracketed photos, select **Merge to HDR Panorama** to merge them into an HDR panorama.
4. In the Panorama Merge Preview / HDR Panorama Merge Preview dialog box, you can set layout options. Choose a layout projection method based on the photos:
   - **Spherical**: Aligns and transforms the images as if they are mapped to the inside of a sphere. This projection mode is great for very wide or multi-row panoramas. It also works well for aerial 360˚ images made with a drone.
   - **Cylindrical**: Projects the panorama as if it is mapped to the inside of a cylinder. This projection mode works really well for wide panoramas. It also keeps vertical lines straight from some architectural images.





- **Perspective**: Projects the panorama as if it is mapped to a flat surface. Since this mode keeps straight lines straight, it is great for architectural photography. Very wide panoramas may not work well with this mode due to excessive distortion near the edges of the resulting panorama. This method usually needs a strong central image and works best with an odd number of source images.

5. Adjust the **Boundary Warp** slider setting (0-100) to warp panoramas/HDR panoramas to fill the canvas. This is useful to remove transparent areas and minimize cropping. A higher slider value causes the boundary of the panorama to stretch to the surrounding rectangular frame.

6. Select the **Auto Crop** setting to remove undesired areas of transparency around the merged image.

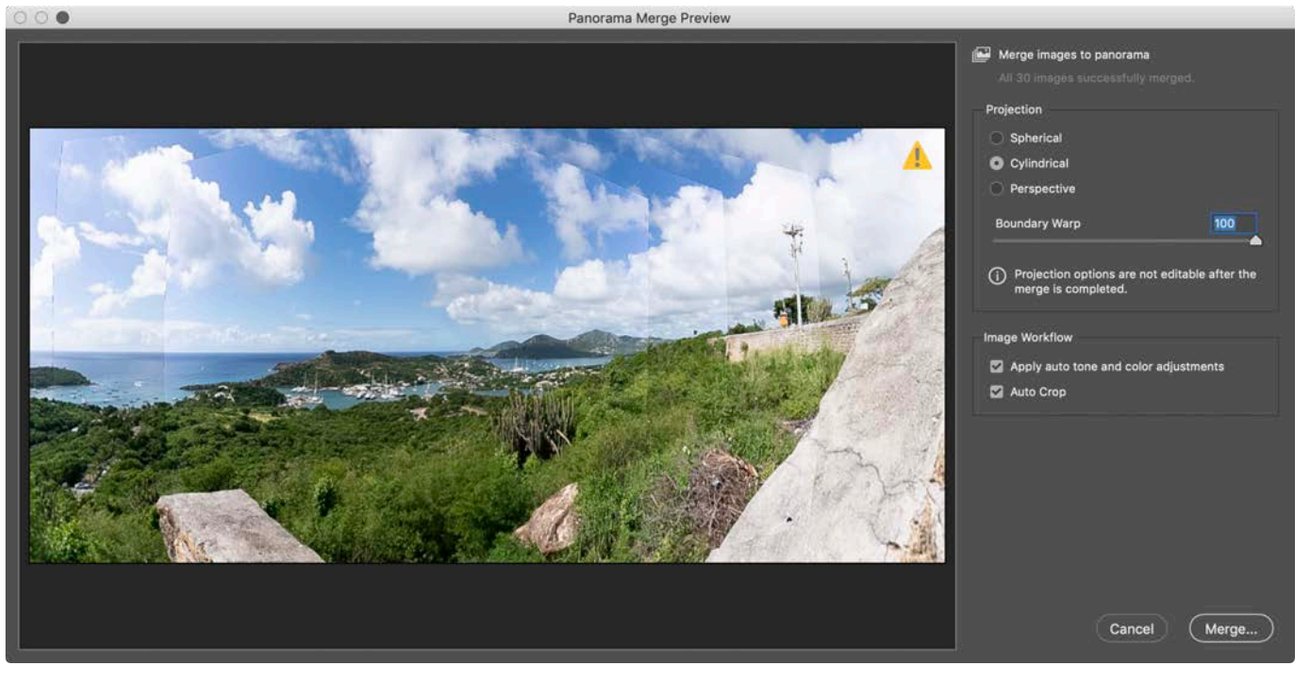
7. When you are happy with the preview image, click **Merge** in the preview dialog box.

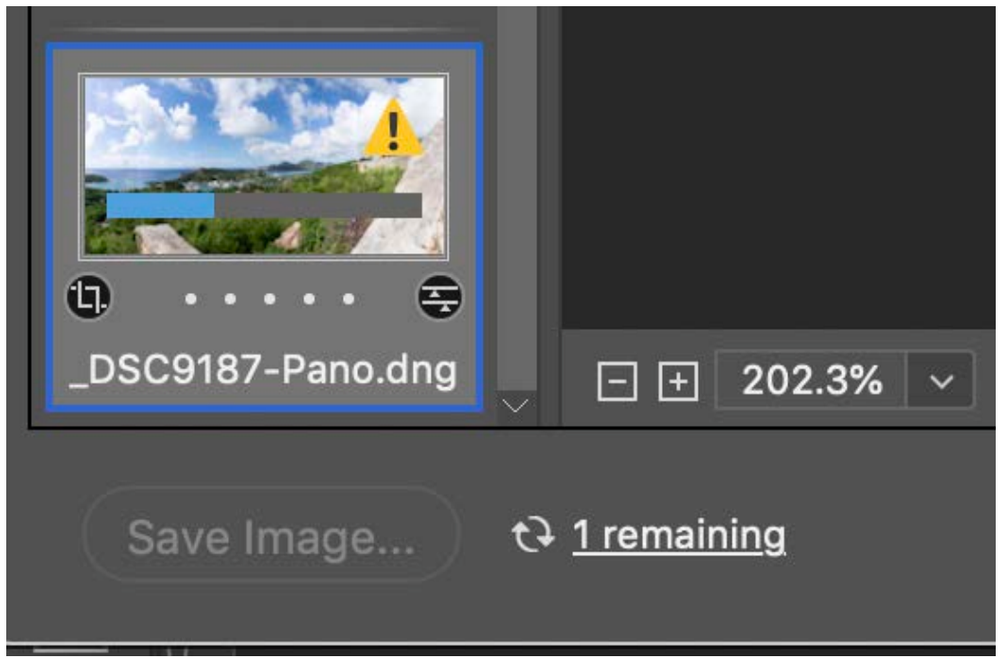
   - In the Merge Result dialog box, you can enter a location and name and click Save.

   - Alt-click Merge to save the panorama in the same folder as the source image with a default file name.

8. The new file may take some time to merge. You can track its progress in the lower left corner.

9. Develop the new raw file like you would any other raw image.





Camera Raw 11.2.1 - Sony ILCE-7RM2

20.5% _DSC9187-Pano.dng Image 31/31

R: 4
G: 15
B: 1

f/6.3 1/8000 s
ISO 800 18 mm

Basic

Treatment: Color Black & White

Profile: Adobe Color

White Balance: As Shot

Temperature 4800

Tint +7

Auto Default

Exposure -0.09

Contrast -23

Highlights -100

Shadows +43

Whites +18

Blacks -22

Clarity 0

Dehaze +33

Vibrance -7

Saturation 0

Save Image... Adobe RGB (1998); 16 bit; 10842 by 5341 (57.9MP); 300 ppi Open Object Cancel Done

CHAPTER 4

PANORAMIC SHORTCUTS

Result	Windows	macOS
Spherical panorama projection	Control + 1	Command + 1
Cylindrical panorama projection	Control + 2	Command + 2
Perspective panorama projection	Control + 3	Command + 3
Auto crop panorama	C	C

SECTION 2

HDR IMAGES

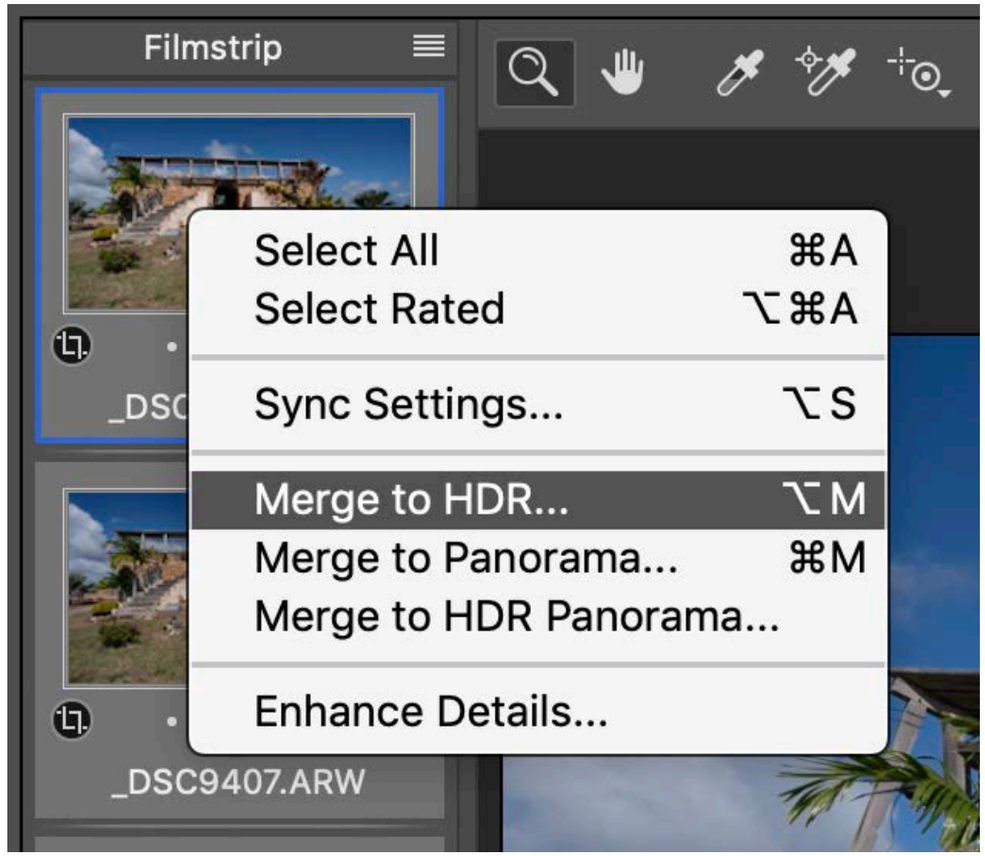
With Adobe Camera Raw, you can merge multiple raw files from a series of exposure bracketed images. Typically, these shots are captured using Auto Exposure Bracketing on a camera to ensure a wider dynamic range. These newly merged DNG files contain more exposure information than a single raw file.

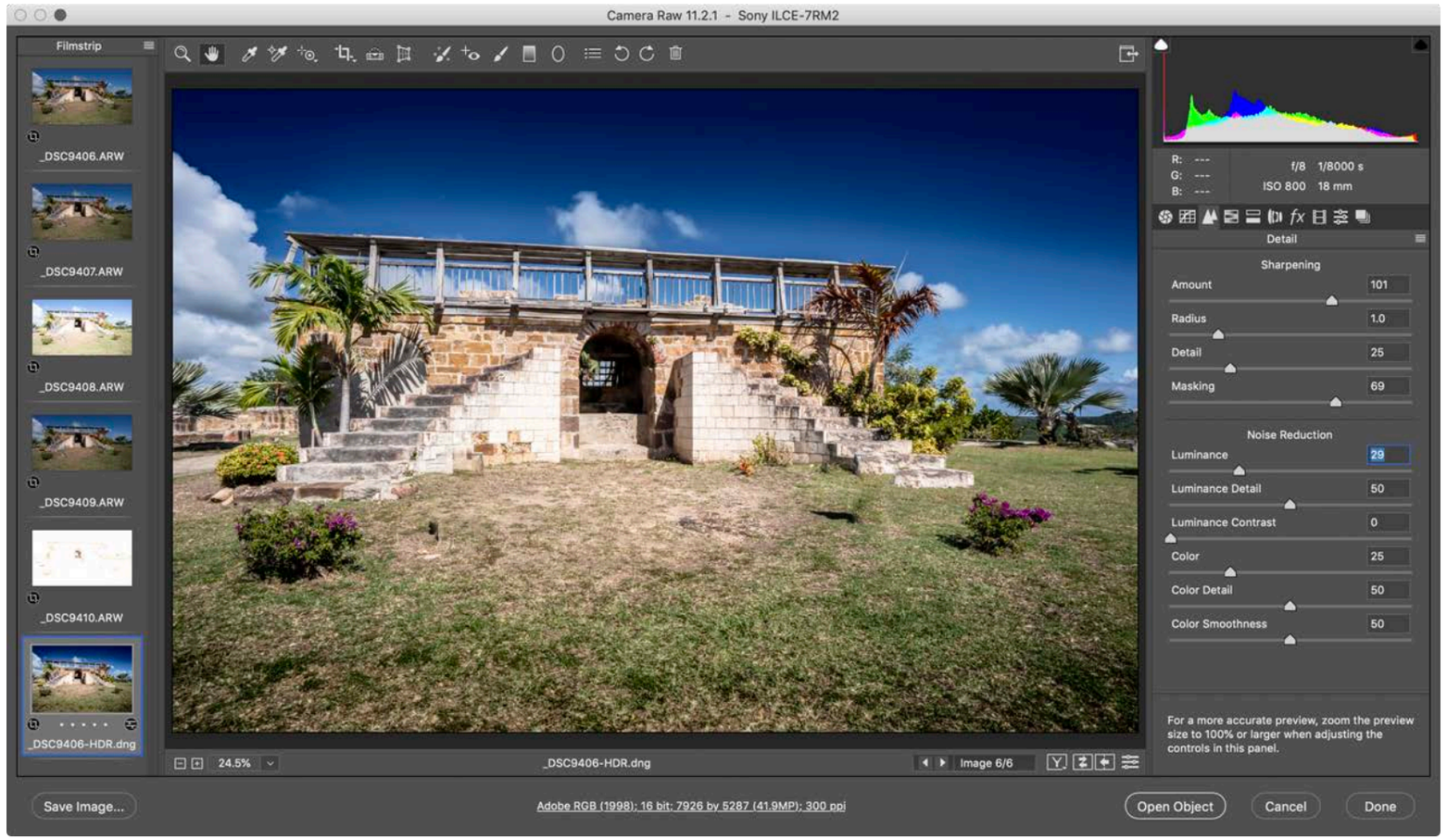
© Neil Thomas

Better HDR Merging

For the best results when merging HDR images, shoot from a tripod or brace the camera. You want to minimize camera movement to prevent soft focus or shake on the longer exposures.

1. Choose File > Open and select multiple raw or DNG source images.
2. In the Camera Raw dialog box, select the images that you want to merge in the Filmstrip panel. To select all images press Command+A (Ctrl+A) or use the Shift key to select a raw images.
3. Right-click on an image in the panel and choose **Merge to HDR.**
4. In the HDR Merge Preview dialog, consider these two options.
   - **Auto Tone:**: Provides a good starting point for an evenly-toned merged image
   - **Auto Align:** Useful if the images being merged have slight movement from shot to shot. Enable this option if the images were shot using a handheld camera. Enabling this option may not be necessary if the images were shot using a tripod.





5. If there was a lot of movement within a shot or a long time between exposures, you may see unnaturally semi-transparent areas. Select one of the following deghosting option in the HDR Merge Preview dialog box to correct these anomalies: None, **Low**, **Medium**, or **High**. Try Low deghosting first to obtain a clean merged image. Go higher if necessary.

6. Click Merge to create the HDR image (.dng).
   - In the Merge Result dialog box, you can enter a location and name and click Save.
   - Option-click (Alt-click)Merge to save the panorama in the same folder as the source image with the default file name.

7. Develop the new raw file like you would any other raw image.

CHAPTER 4

HDR SHORTCUTS

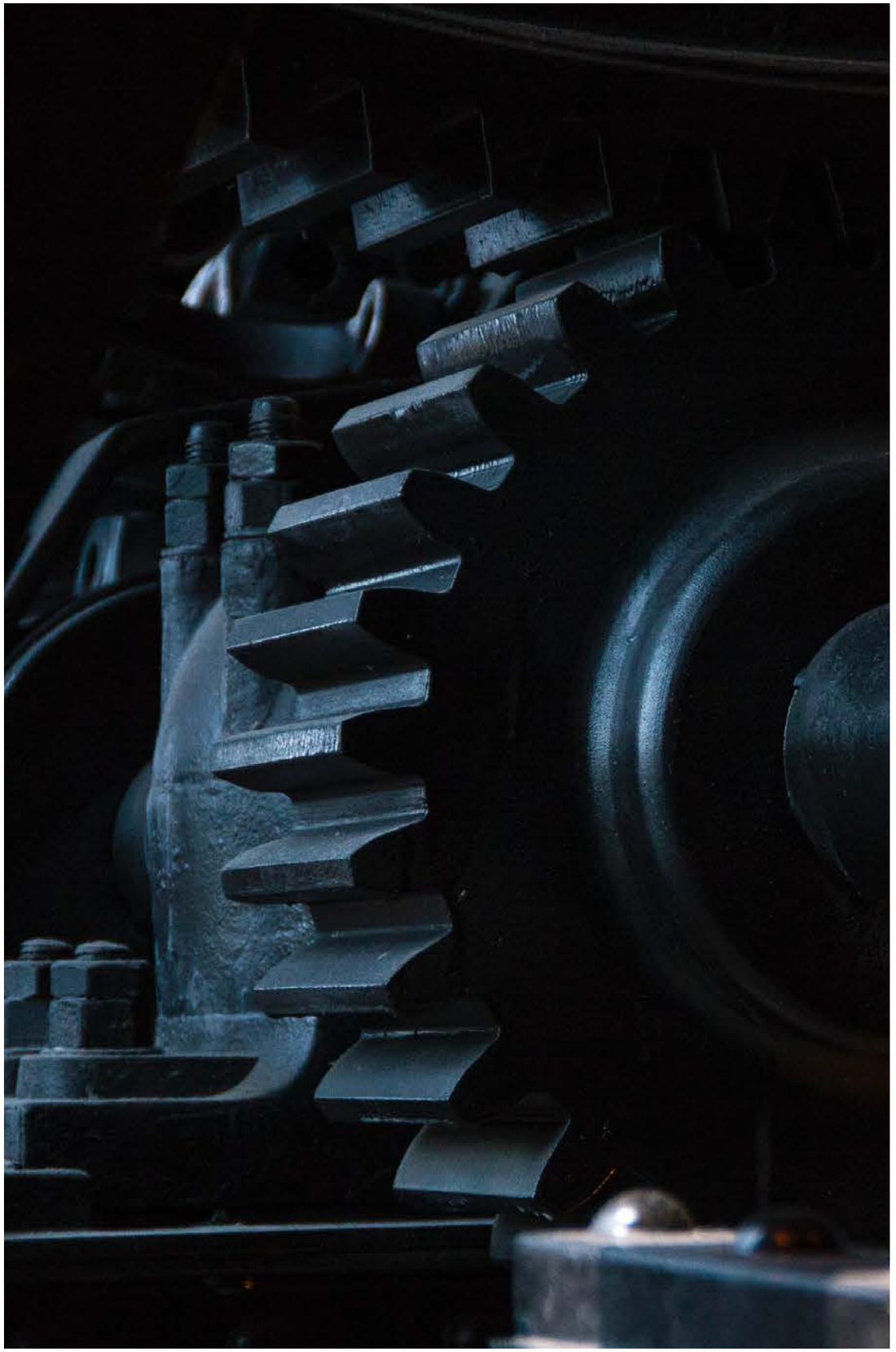
Result	Windows	macOS
Align source images	A	A
Visualize deghosting	Y	Y
Auto tone HDR result	T	T

SECTION 3

WORKFLOW OPTIONS

Near the bottom of the Camera Raw window is an unobtrusive line of text. On first glance it appears to list the specs for the file that will be created. If you look closely, you'll notice that this text is underlined like a hyperlink. Clicking it opens a world of options and some truly useful commands.

This easy to miss control is called Workflow options. It's how you can specify settings for all files output from Camera Raw, including the color bit depth, color space, output sharpening, and pixel dimensions. These are the instructions on how Photoshop will open these files.



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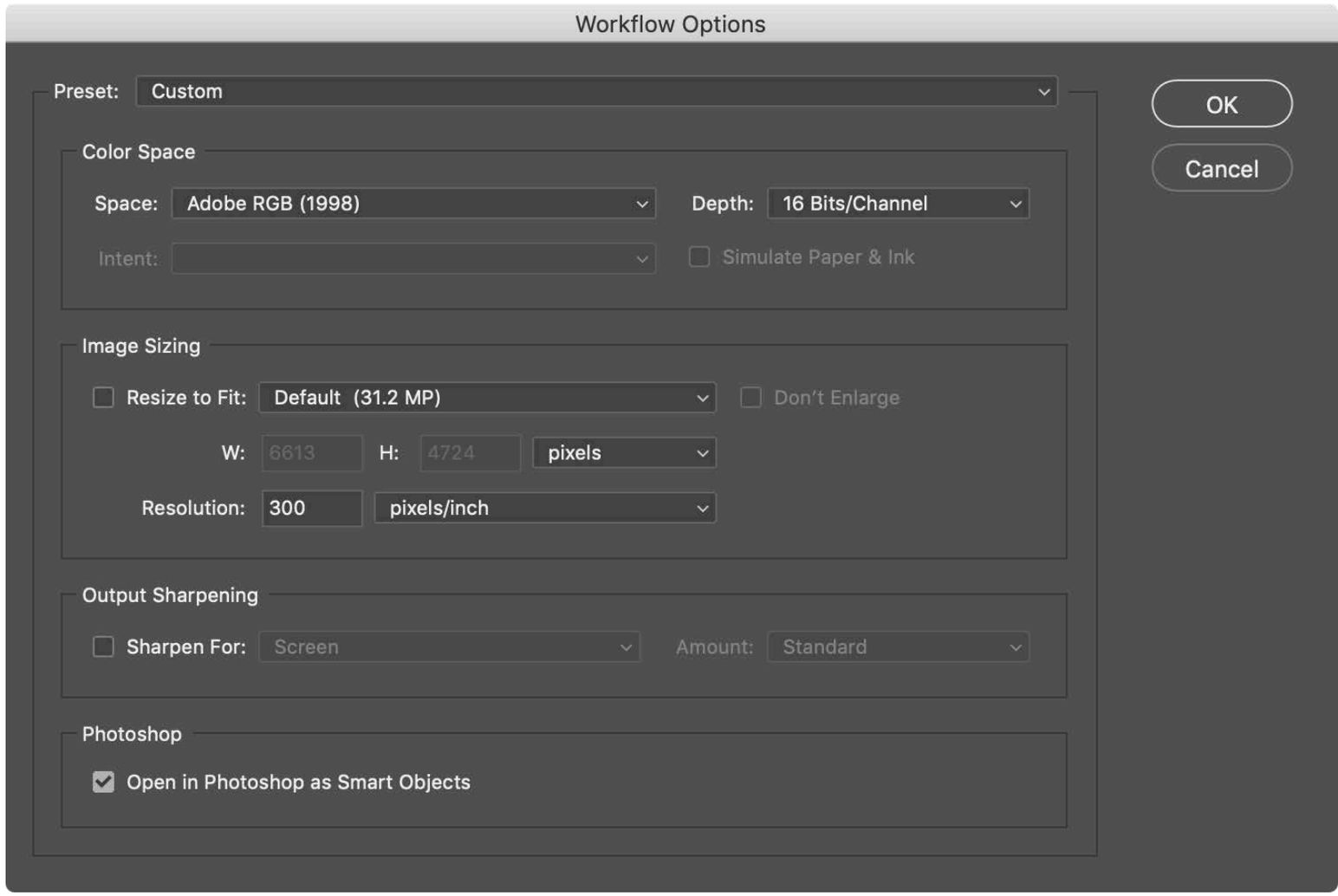
SPACE

This controls which color space is used when you open the file. The standard is the **Adobe RGB** working space. But you can choose any color space that you have loaded to adjust for printing output or other workflows.

The profiles listed in the Space menu are built in to Camera Raw. To use a color space that's not listed, choose the ProPhoto RGB space. A file opened in this color space can easily be converted to what ever space a printer/paper combination requires.

DEPTH

Specifies whether the file opens as an 8-bpc or 16-bpc image in Photoshop. The 16 bits per channel option is ideal for the maximum image quality and accuracy of color and tone.



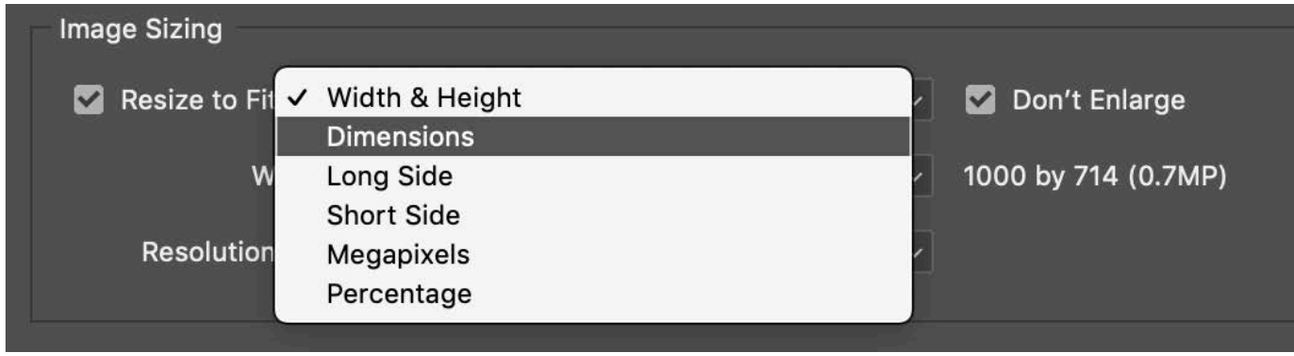
SIZE

Specifies the pixel dimensions of the image when imported into Photoshop. You can choose from a variety of options for measurement as well as enlarging or reducing the photo when you open it.

- The default pixel dimensions are those used to photograph the image.
- Check the Resize to Fit box and choose a size from the menu.
  - Enter a specific width and height
  - Enter a not to exceed size
  - Choose a megapixel count
  - Scale based on a percentage of the original size
- Choosing a smaller-than-native size can speed processing when you are planning a smaller final image.
- Picking a larger size is like upsampling in Photoshop.
- You can always change the pixel size of the image after it opens up in Photoshop.

RESOLUTION

Resolution identifies the pixels per inch at which the image is printed. This has no effect on the total pixel count and only effects the print output. An output of 240 pixels or higher is often used for printing while 72 to 120 pixels is used for screen application. You can also use the Image Size command to adjust resolution in Photoshop.



SHARPEN FOR

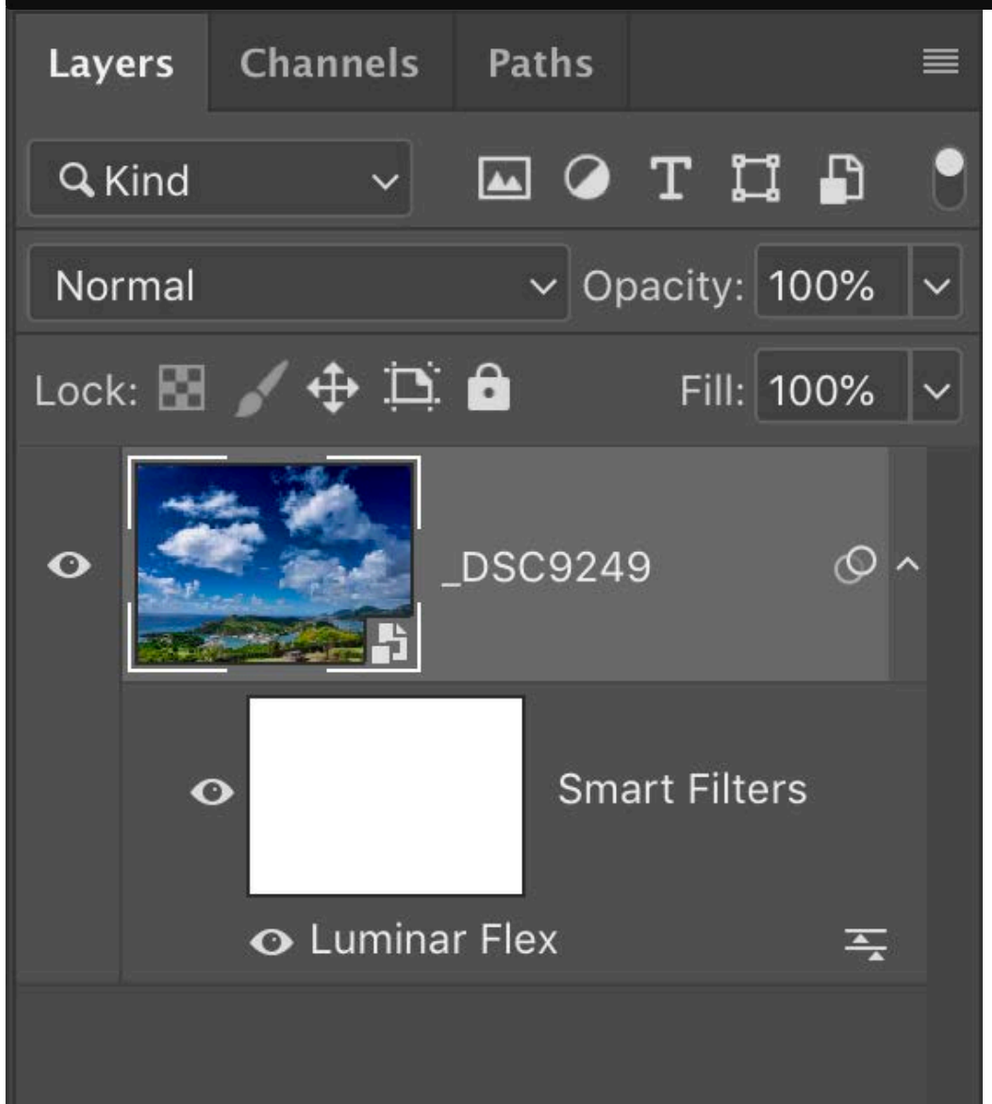
This useful option applies output sharpening for Screen, Matte Paper, or Glossy Paper. You can choose between three strengths with the Amount pop-up menu. In most cases, you can leave the Amount set to the default option, Standard. This is a useful option to preserve edge detail.

OPEN IN PHOTOSHOP AS SMART OBJECTS

When checked, this option opens the raw photo as a Smart Object layer instead of a background layer. This is very useful for several reasons,

- A **backup copy** of the raw file is embedded into the Photoshop layer (it can be exported on its own if needed in the future).
- Double-clicking the Smart Object layer returns you to editing the embedded raw image with **no loss of quality.**
- The layer can be nondestructively **scaled** or **transformed** while retaining all of the original detail for future adjustments.
- **Photoshop filters** can be applied non-destructively to the layer.

This option is **HIGHLY** desirable and should be checked for most workflows. To override this preference for selected images, hold the **Shift** down when clicking the **Open** button.



SECTION 4

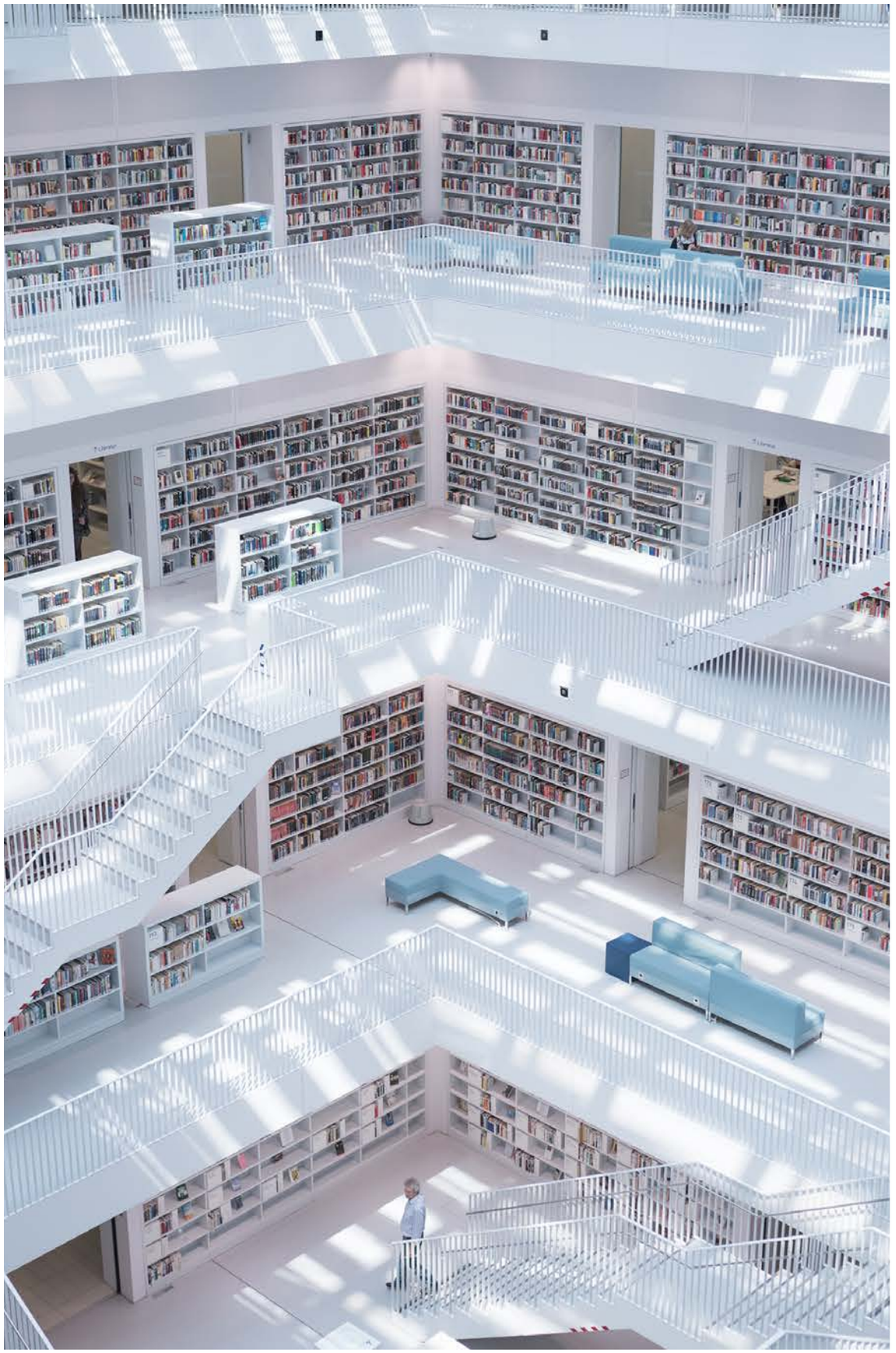
SAVING FILES

Once you've developed one or more images, it's time to save. You can choose to export directly from the Camera Raw dialog box as a **PSD**, **TIFF**, **JPEG**, or **DNG** format file..

When you click the Save Image command in the Camera Raw dialog box, files are placed in a queue for processing. This is useful if you are creating several files at once and saving them in the same format.

Syncing Feeling

Remember, you can synchronize multiple files to use the same settings. Choose the reference image first and then select the rest. With a right-click you can choose Sync Settings. You can now Save multiple images too!



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SAVE A RAW IMAGE IN ANOTHER FORMAT

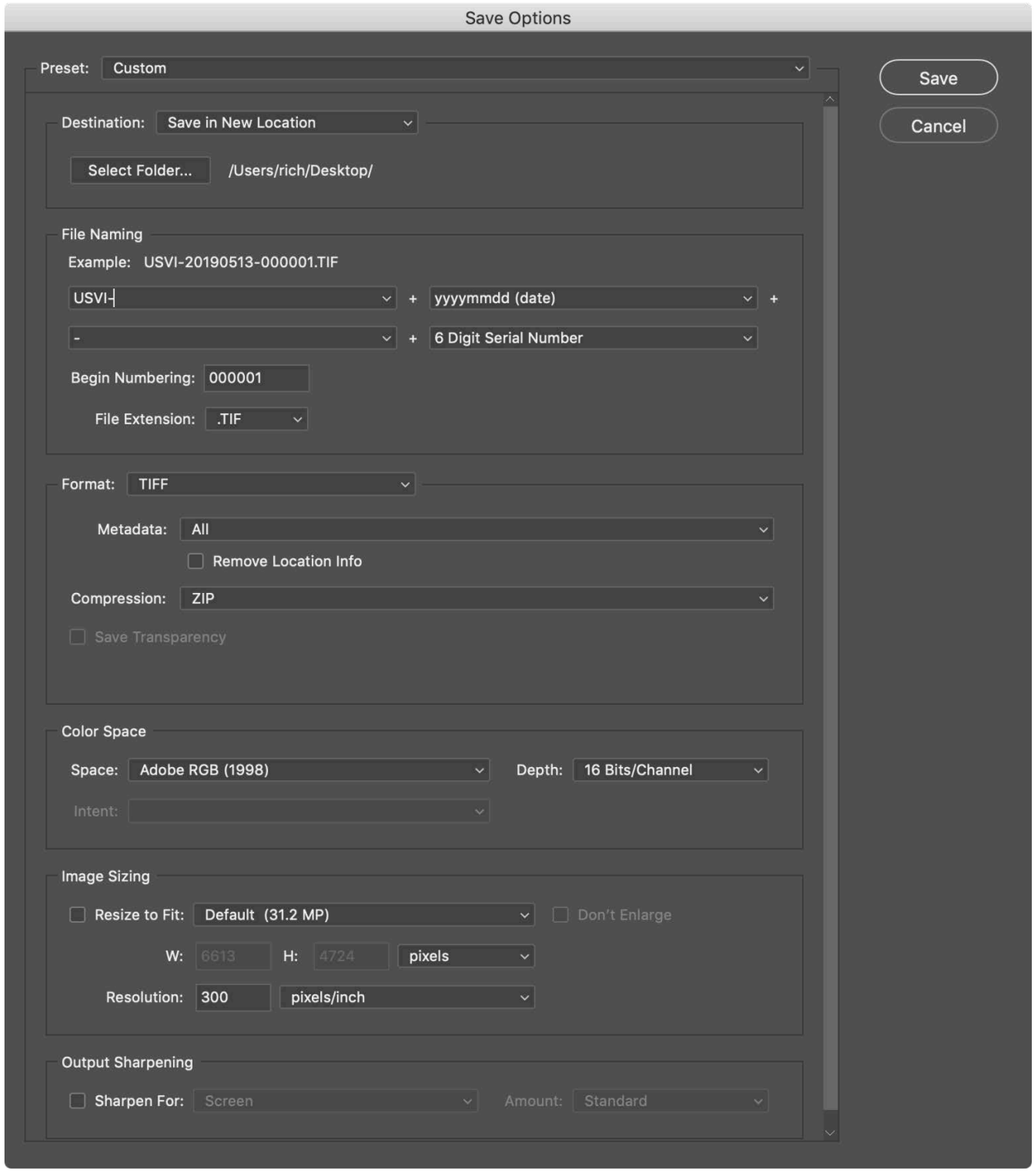
1. In the Camera Raw dialog box, click the **Save Image..** button in the lower-left corner of the dialog box. This opens up a new dialog to specify options. If you Option-click (Alt-click) the Save Image button, the last specified settings will be reused.

2. In the Save Options dialog box, specify the following options:

   - **Destination:** Specifies where to save the file. If needed, click the Select Folder button and navigate to the desired location.

   - **File Naming:** Specifies the filename using a naming convention that includes elements such as date, original name and camera serial number. Using descriptive filenames based on a naming convention helps you keep image files organized on your hard drive.

3. Choose a file format from the Format menu.



- **Digital Negative:** This saves a copy of the raw file in the universal DNG file format. Use the Compatibility option to specify the versions of Camera Raw and Lightroom that can read the file.
    - By default, the conversion uses lossless compression, which means no information is lost while reducing file size.
    - Choosing **Linear** (Demosaiced) option stores the image data in an interpolated format. This means other applications can read the file even if that software doesn't have a profile for the digital camera that captured the image.
    - **JPEG Preview:** Embeds a JPEG preview in the DNG file. If you decide to embed a JPEG preview, you can choose the preview size. If you embed JPEG previews, other applications can view the contents of the DNG file without parsing the camera raw data.
    - **Embed Original Raw File:** Stores all the original camera raw image data in the DNG file.
- **JPEG:** Saves copies of the camera raw files in JPEG (Joint Photographic Experts Group) format.
    - To specify the amount of compression, enter a value from 0 to 12. Using. a higher value applies less compression and increases file size and image quality.
- **TIFF:** Saves copies of the camera raw files as TIFF (Tagged-ImageFile Format) files.
    - Specify whether to apply no compression, or LZW or ZIP file compression to reduce file size.
    - TIFF is a flexible bitmap image format supported by nearly all paint, image-editing, and page-layout applications.
- **Photoshop**: Saves copies of the camera raw files in the PSD file format. You can specify whether to preserve cropped pixel data in the PSD file.

4. When ready, click **Save** to create the file(s)..

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