Nikon Lenses

From Snapshots to Great Shots

Jerod Foster

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Peachpit Press

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Dedication

To the great folks at Peachpit, the best team with which I’ve ever worked.

Acknowledgments

It takes a team of great individuals to put together a project like this one, and I'm lucky to have worked with the wonderful folks at Peachpit for several of these books! Specifically, I would like to thank Susan Rimerman, Suki Gear, Lisa Brazieal, Elaine Merrill, James Minkin, Ted Waitt, and Sara Todd. I couldn't ask for a better team, and their patience with my travels and assignment work was invaluable in making sure the book stayed on the rails. Thank you, all.

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Thanks also to my friends at Armadillo Camera for their generous support in lending me some lenses that I don't own. Steve, Larry, Wayne, and Raymond are the kind of fellows you want in your own local camera shop, and they were a great resource along the way.

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A large amount of gratitude goes to my wife, Amanda, and my two daughters, Eva and Lola Mae. Your support means the world to me, and your patience is infinite. Thanks for not only being a part of this project, but also for the continual love and encouragement you give me in every endeavor. Thank you will never be enough for you three. I love you very much!

Finally, thanks to anyone else who had a role in making this project come together—LIGHT Creative Co-Studio, Mike, Seth, Naomi, and countless others. Thank you.

Contents

Introduction

Photography just wouldn't be the same without the glass. Sure, we could make images without lenses, but then we'd be stuck with simple blobs of light and color. Lenses help us focus that light into discernable imagery. This book is all about how to make the most of the lenses we have in order to create art and tell the story of our environment and the people we encounter.

When executive editor Ted Waitt and I first sat down to discuss this project, it was clear that within the Snapshots to Great Shots series there was a need for a book on Nikon (Nikkor) lenses to complement the great texts on various Nikon camera-body models. Those books discuss lenses, but they are more about helping the reader become acquainted with the camera and photography in general.

What's Covered in This Book?

Chapter 1 highlights the top factors to consider when using and shopping for Nikon lenses, serving as a quick guide to the technology. Chapter 2 gets more technical and defines important terminology related to lenses and their use, such as depth of field, plane of critical focus, and perspective.

The next four chapters highlight different categories of Nikon lenses based on their focal lengths (Chapters 3 through 5) and specialty purpose (Chapter 6). These chapters are where the rubber meets road, so to speak. They identify why certain lenses work well for specific types of photography, address key issues to consider when using lenses, and ultimately (my goal) help the reader start to produce great images using different focal lengths.

Lastly, Chapters 7 and 8 are resources. Chapter 7 highlights useful and even essential accessories to have when shooting, such as teleconverters, extension tubes, and several types of popular filters. Chapter 8 is a practical extension of Chapter 1 in that it covers in detail several best practices photographers can employ when using and maintaining their lenses.

Make sure to download bonus Chapter 9, "Postprocessing," which identifies several strong functions of Adobe Lightroom that can be used to correct lens issues and/or creatively apply lens effects to your images. First log in or join Peachpit.com (it's free), then enter the book ISBN (9780133904062) on this page: peachpit.com/store/register.aspx. After you register the book, a link to access bonus content will appear next to the book on your Account page in the Registered Products tab. NOTE: If you purchased an ebook, you're covered—the chapter is already included.

Not a Technical Manual

This book serves as a great companion to other books centered around particular Nikon camera models, but it also stands alone as a resource for getting the most out of your lenses. The book is chock-full of techniques and visual examples of lens use. Like all Snapshots to Great Shots books, this book is fairly anecdotal and refrains from being too technical, instead opting to show you how you can creatively employ your gear to achieve the images you want. The majority of images you see in the book were made on assignment or for stock image use, and I relate the text to the focal length and/or technique used for each.

This book is not a lens catalog, either. I provide tips on shopping for Nikon lenses, and I offer up my preferred selection in each category (in sidebars titled “If I Had to Choose”), but if you’re looking for a discussion on every lens manufactured, head to Nikon’s website.

Have Fun and Experiment

Remember, this book is just a guide. Don’t get stuck only using one technique or compositional rule in only one setting. Experimenting is a vital part of developing your own style and photographic vision. My hope is for you to become so comfortable using your lenses that they almost become an extension of your mind. At the end of each chapter, you will find a link to the book’s Flickr page, where you can show the rest of the world the fruits of your creative labor! I look forward to seeing your work soon.

1. The Nikon Lenses

ISO 100 • 1/500 sec. • f/2.8 • 200mm

Top eight considerations

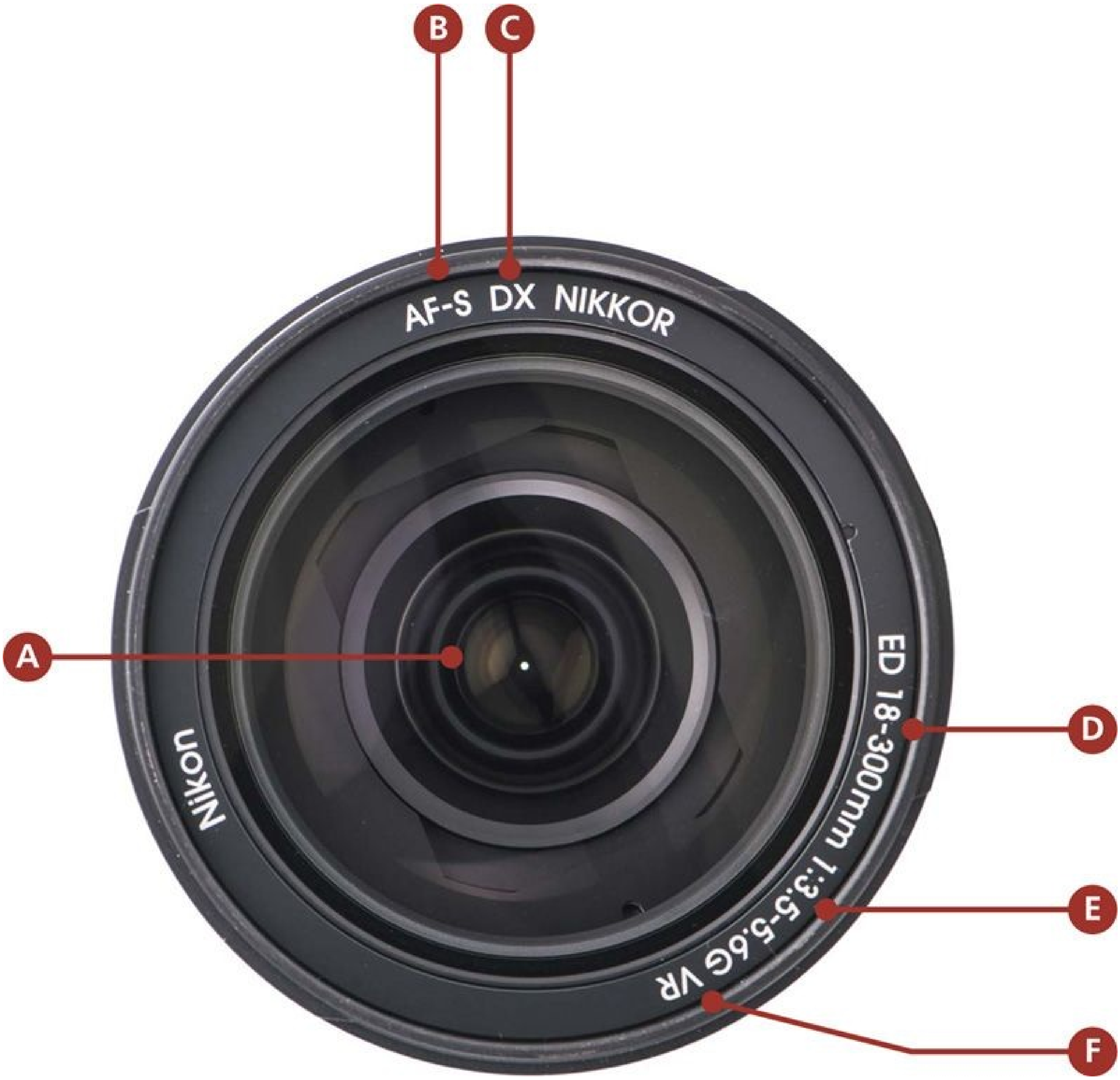
Photography wouldn't be much without lenses. Sure, you can make images without them, but if you want something more than just a blob of light and color, lenses come in quite handy. All you really need to make images is light, a way to focus the light, and something to capture or fixate the light. A lens's basic function is to channel a reflection of light through a number of pieces of glass (referred to as elements) and project it on the sensor or film. But lenses do so much more than just focus light.

Used well, they help bring our creative vision to some sort of reality. Lenses are an essential part of the photography equation. Each lens has its special use, and when you are pushing the limits of that use, all lenses offer creative routes to making great images!

Consider the following eight issues not only for researching and purchasing a new lens for your camera body, but also for learning about and using lenses in a way that resembles how a skilled artisan uses her tools.

Poring Over the Lens

Lens Front



A Front lens element
B Lens type (AF or AF-S)
C Cropped-sensor designation (DX)
D Focal length
E Maximum aperture value
F Vibration Reduction designation (VR)

Lens Side

A Zoom ring
B Focus ring
C Auto/Manual focus switch
D Lens mount
E Vibration Reduction switch (only on VR-equipped lenses)
F Vibration Reduction method switch (only on VR-equipped lenses)
G Focus range limit switch

Poring Over the Lens

Lens Rear

A Lens mount lock
B Lens contact points (transmits information between the lens and camera body)
C Rear lens element

1. Lens Nomenclature

Looking at a Nikon lens and trying to decipher what all the letters and numbers mean can be an exercise in frustration. As you can see in **Figure 1.1**, there is a lot of code on the lens. If you know what you are seeing, it's easier to pick the right lens. Think of the following as your decoder ring to the Nikon lens system.

Figure 1.1 The AF-S Nikkor 18–55mm f/3.5–5.6G DX lens. Sounds great, but what does that all mean?

- **mm**—The focal length (or focal length range) of the lens in millimeters. Prime lenses have a single number; zoom lenses have two numbers showing the focal range.
- **AI/AIS**—In 1977, Nikon introduced a new coupling system called "Automatic maximum aperture indexing," or AI. The AI lenses were followed by the updated AIS lenses, allowing for more precise control over the aperture by the camera. These are manual focusing lenses that allow you to meter with the lens wide open; the camera changes the aperture to the set value when you take a photo. AI/AIS lenses mount on any Nikon camera, but you will need to focus them manually.
- **E**—The Nikon E-type lenses were budget lenses created for lower-end film cameras. These lenses were usually made of plastic and not as durable as the higher-end lenses.
- **D**—The D-type lenses can read the distance from camera to subject. The camera then uses this information to get better exposures by a flash.
- **G**—The G-type lenses have no aperture control ring and are for use on cameras where the aperture control is solely on the camera. They cannot be used on older

cameras. These lenses also have the same distance-reading capabilities as D-type lenses and transmit information to the camera so flash power can be adjusted for the best exposure possible.

- **AF-I**—Auto Focusing-Internal lenses were the first autofocus lenses with built-in motors. This technology was built into the super-telephoto lenses. There is an electronic connection, not a mechanical one, between the lens and the camera to control the autofocus. All the AF-I lenses are also D-type lenses.
- **AF-S**—Short for Auto Focus-Silent Wave Motor, AF-S lenses are autofocus lenses equipped with the Silent Wave Motor (SWM). These lenses were first introduced in 1996 as an update to the AF-I lenses. The motors in these lenses allow the photographer to adjust the focus manually even if the motor is engaged. AF-S lenses work on the entire line of digital SLR cameras. While the AF-S technology was originally only in the more expensive lenses, it is now used across the Nikon line of lenses.
- **DX**—The DX designation means the lens was created for cameras with the smaller cropped digital DX sensor. Designed in 2003, DX lenses have fairly wide focal lengths to help negate crop factor. For example, the widest regular lens available before the DX lenses was the 17–35mm f/2.8, which cost close to US$2,000 and still gave a pretty normal 26–50mm view on the cropped sensor. The first DX lens, the AF-S DX Zoom-Nikkor 12–24mm f/4G IF-ED (shown in **Figure 1.2**) allowed the camera to capture the equivalent of the 20–35mm lens.

Figure 1.2 The first DX lens, the AF-S DX Zoom-Nikkor 12–24mm f/4G IF-ED. The text on the lens tells you everything.

- **VR**—The VR designation means that the lens has the Nikon Vibration Reduction technology built into the lens. The VR technology tries to compensate for any lens shake when you are shooting at slower shutter speeds.

- **VR II**—Some of the newer lenses have the VR II designation, which is the second generation of the Nikon Vibration Reduction technology.
- **ED**—The Extra-low Dispersion glass produced by Nikon produces better looking images even with different light wavelengths. When this lens technology first came out, the lenses had a distinctive gold band and the ED label. This type of glass was a breakthrough for the longer focal lengths as it reduced the green-magenta color fringes that affected lenses at 300mm and longer.
- **Micro-Nikkor**—Lenses with the Micro-Nikkor designation are those designed for extreme close-up work. These would be called macro lenses by any other company.
- **IF**—The IF stands for Internal Focusing. These lenses do not change size when you are focusing.
- **DC**—The DC designation is for lenses that have the Defocus Control technology, which allows you to control how the out-of-focus background areas are rendered.
- **N**—The N designation means that the lens has a nanocrystal coating that improves the clarity of images. This technology was introduced in 2006 and was meant to replace the multilayer coating used previously.

Let's look at a few of the most popular lenses in the Nikon lineup and decipher the code. One of my favorite lenses is the AF-S Nikkor 70–200mm f/2.8G ED VR II, which has a built-in Silent Wave Motor for autofocusing. It has a focal range of 70mm to 200mm and a maximum aperture of f/2.8 at all the focal lengths. This is a G-type lens, meaning it has no aperture ring. The lens also uses the ED glass and has the newest version of Vibration Reduction. The AF-S Nikkor DX 18–200mm f/3.5–5.6G ED VR II lens also has a built-in Silent Wave Motor for autofocusing and is specifically designed for cropped-sensor (or DX) cameras. The lens has a maximum aperture of f/3.5 at 18mm and f/5.6 at 200mm, and because it is a G-type lens, there is no aperture ring. The lens uses the ED glass and the latest Vibration Reduction technology.

Nikon and Nikkor

Nikon lenses all have the name Nikkor on them. What exactly is Nikkor, and why are the lenses not just called Nikon lenses? Nikkor is a subsidiary of the Nikon Corporation. The Nikkor brand was introduced in 1932, and in 1933 Nikkor produced the first Nikkor lens. The Nikkor lens actually predates the Nikon camera, which was introduced in 1946. Originally, the Nikkor brand was used for higher-end optics, while the Nikon designation was used for lower-end products. Now the Nikkor name is used for all the lenses. Nikkor also created lenses for other cameras, including the Bronica and Plaubel Makina medium-format cameras, the Leica rangefinder cameras, and the Nikonos underwater cameras. For this book, the Nikkor lenses created with the F-mount for 35mm and digital cameras will be referred to as Nikon lenses.

2. Fast vs. Slow Lenses

Within all lenses, there is something called the aperture. More specifically, the mechanism that makes up the aperture is the diaphragm, a ring of overlapping, thin metal plates that either close down or remain open during exposure. For the sake of clarity, we refer to this mechanism as the aperture.

The aperture controls two things: how much light is let in through the lens and exposed on the sensor (or film), and depth of field, or how much of the shot is in focus. We'll discuss these two points in the next chapter.

Lenses are often described as either fast or slow, based on their maximum aperture openings. When you are making an exposure in any given light condition, the larger, or more open, the aperture is, the *faster* the shutter speed needs to be. When you allow a large amount of light to pass through the lens, you need to cut it off more quickly for a proper exposure. Conversely, an aperture that is closed, or stopped down, in that same light condition requires a *slower* shutter speed to create the exact same exposure (**Figures 1.3** and **1.4**). Essentially, faster lenses are those with large maximum apertures, and those that cannot open up as much are referred to as slower lenses.

ISO 200 • 1/1000 sec. • f/2.8 • 46mm

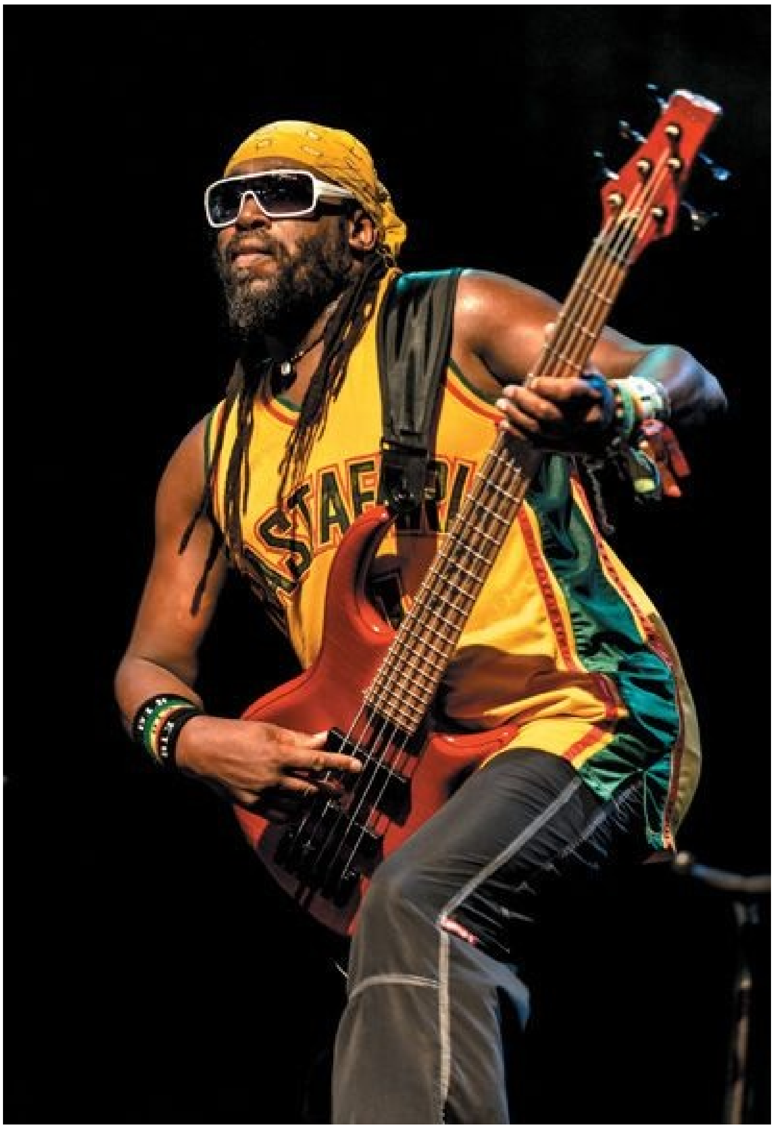
Figure 1.3 At f/2.8, the lens's aperture is considered fast since it allows much more light in at one time than a slower aperture value, such as f/5.6 (see Figure 1.4).

ISO 200 • 1/250 sec. • f/5.6 • 46mm

Figure 1.4 An aperture value of f/5.6 is two stops slower than f/2.8, meaning the shutter speed used in this shot is two stops slower than the speed used in Figure 1.3.

Nikon makes several variations of many of its lenses, and much of the variance is aperture based. For example, there are two different 50mm lenses in the Nikon lineup that come with a built-in focusing motor: the AF-S Nikkor 50mm f/1.4G and the AF-S Nikkor 50mm f/1.8D (plus an older model, the AF Nikkor 50mm f/1.8D). The number following the f-stop is used to identify the maximum aperture opening—the lower the number, the larger the opening.

The AF-S Nikkor 50mm f/1.4G is faster than the AF-S Nikkor 50 f/1.8D. Practically speaking, the AF-S Nikkor 50mm f/1.4G—at its maximum aperture—lets in more light and allows the shooter to use faster shutter speeds than the other allows. This comes in handy when you are shooting in low-light conditions (**Figure 1.5**). As we'll discuss later, faster lenses are also valuable on the sports field.



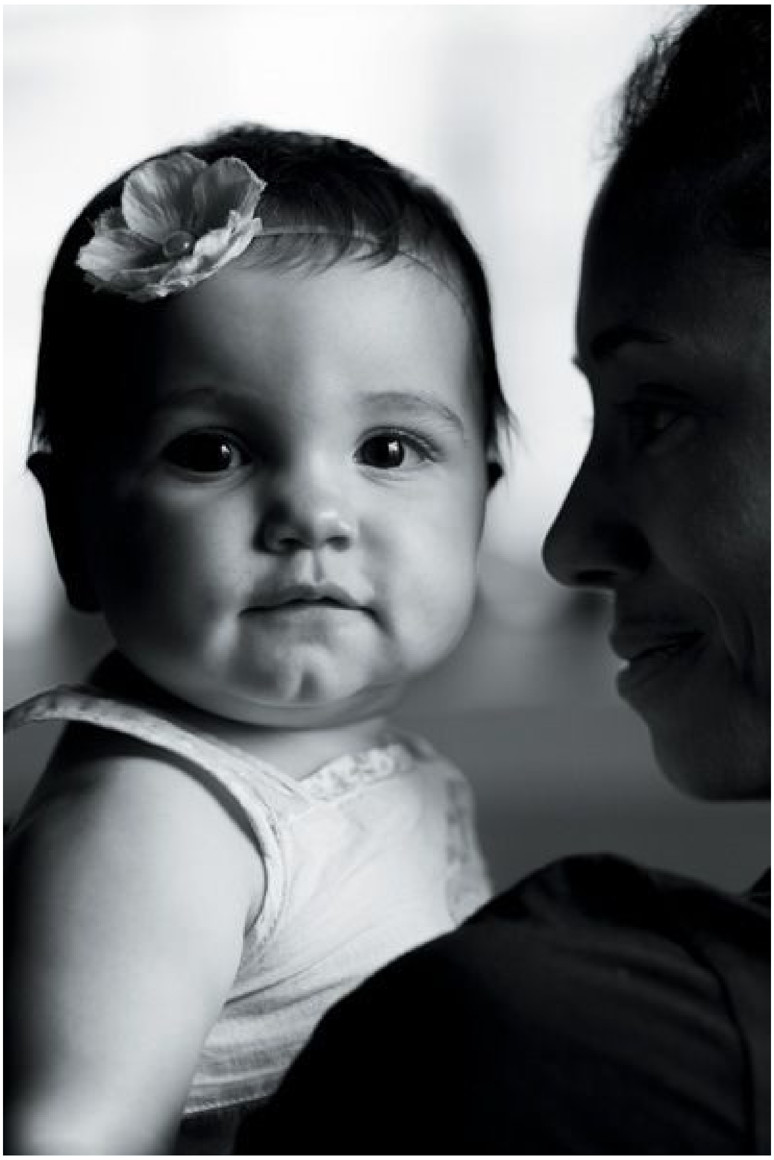
ISO 1600 • 1/320 sec. • f/2.8 • 200mm

Figure 1.5 Shooting live music requires a fast aperture to freeze the action and handhold longer lenses.

These 50mm lenses are non-zoom lenses (also known as prime lenses, covered later in this chapter). Nikon also manufactures many great zoom lenses, and in doing so, introduces another issue—speed of zoom lenses. Some lenses, such as the AF-S Nikkor 24–70mm f/2.8G ED and the AF-S Nikkor 70–200mm f/2.8G ED VR II have a fixed f/2.8 maximum aperture opening. However, other lenses, such as the AF-S Nikkor 18–55mm f/3.5–5.6G VR II and the AF-S Nikkor 70–300mm f/4.5–5.6G IF-ED, have what is commonly known as *variable maximum apertures*. Simply put, lenses with variable maximum apertures will close down their maximum aperture as they are zoomed in to the scene. For example, when you are shooting with an AF-S DX Nikkor 18–55mm f/3.5–5.6G VR II lens at 18mm—the widest focal length on that lens—the maximum aperture is f/3.5. When zoomed in to 55mm, though, the maximum aperture changes to f/5.6. Along the zoom range, as the focal length increases, the maximum aperture changes to a slower aperture.

These types of lenses are fairly common, and the variable maximum aperture is a result of using smaller-diameter lens elements in the lens, which subsequently keeps costs down. It's worth noting here that the faster the lens, the more expensive it is. It takes more materials to manufacture faster lenses—more glass, more housing for that glass—since the diameter of the lenses is larger.

Lens speed also refers to how a lens handles depth of field, so keep in mind that the faster the lens, the more one can theoretically throw the background (and foreground for that matter) out of focus. Consider again the 50mm example above. The AF-S Nikkor 50mm f/1.4G, while set at f/1.4, will produce a softer *bokeh* (the area of the image that goes out of focus when using a faster aperture) than the AF-S Nikkor 50mm f/1.8D (**Figure 1.6**). It might be a stretch to see the difference between f/1.4 and f/1.8, but it is there. A more extreme example is the difference between the iconic sports lens, the AF-S Nikkor 400mm f/2.8G ED VR used at f/2.8, and the AF-S Nikkor 80-400mm f/4.5–5.6G ED VR used at 400mm with a maximum aperture of f/5.6. There is a considerable difference between the lowest amounts of depth of field each produces when set to maximum aperture.



ISO 50 • 1/200 sec. • f/1.8 • 50mm

Figure 1.6 An aperture lower than f/2.8 offers a unique way of isolating portrait subjects from otherwise distracting backgrounds. At f/1.8, there is only a sliver of the baby in focus, while the rest of the foreground and background soften drastically.

3. Full-Frame vs. Crop Sensors

Even if you’re new to the world of digital single-lens reflex (DSLR) photography, you’ve probably heard a comparison between full-frame and crop sensors. It might not have meant much to you when purchasing your first camera, but it certainly means a lot in regard to the use of lenses and your future lens purchases.

Full-Frame Sensors

A full-frame sensor is the same size as a 35mm film frame—just think of the film shot in many pre-digital cameras. You can find full-frame sensors in the current Nikon camera models, such as the DF, D610, D750, D810, and the D4S, and all of the older D4, D600, D700, D800/E, and D3, D3S, and D3X models. Nikon uses the designation FX for all of the full-frame sensor cameras. For those photographers moving from film SLR cameras to a DSLR, a full-frame sensor does not affect how you use your lenses and see your images, and you can more than likely use the same lenses. For many, particularly portrait photographers, landscape photographers, and photojournalists, a full-frame sensor is much desired for many reasons beyond how it correlates with the use of our lenses.

Crop Sensors

A crop sensor shares the same rectangular perspective (often referred to as the 3:2 ratio) but is considerably smaller. How much smaller? For Nikon crop-sensor, or DX, cameras, a bit more than 50 percent smaller. At the time of writing, Nikon makes only one size of crop sensor, which measures approximately 24mm by 16mm (**Figure 1.7**). These sensors can be found in all the current DX cameras—the D3300, D5300, and D7100.

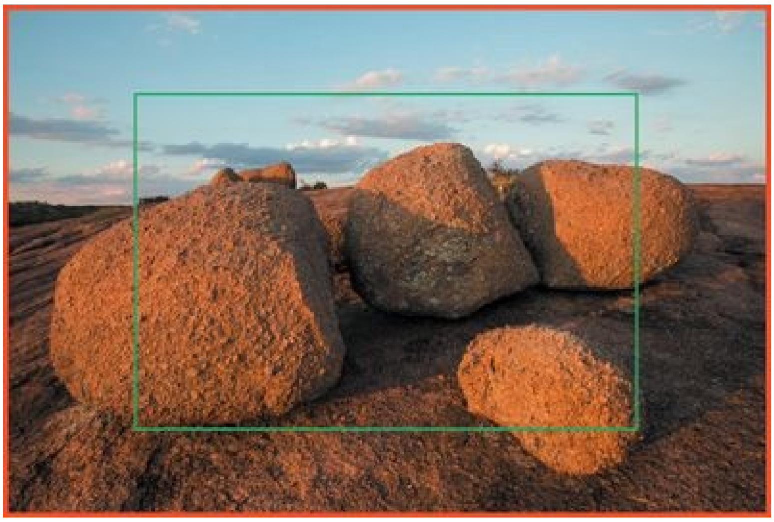


Figure 1.7 This image represents what you would capture using the two different-sized Nikon sensors. The red stroke represents a full-frame (FX) shot made at 17mm. With the same lens, the smaller DX sensor captures a tighter shot (outlined in green) because of its 1.5x crop.

The size difference for crop sensors is determined by the sensor’s *crop factor*. This is where the sensor matters when it comes to lenses. A Nikon DX crop sensor has a crop factor of 1.5x. The larger the crop factor, the smaller the sensor. For the crop factor to become relevant in this case, you must multiply the focal length of the lens by 1.5 to determine the actual focal perspective in which you are shooting. Sounds confusing, and it is unless you see it for yourself!

Let’s say you are using a 50mm focal length on both a full-frame (FX) camera, such as the Nikon D810, and on an crop-sensor camera (DX), such as the Nikon 7100. For the full-frame camera, which has a crop factor of 1x, the perspective provided when looking through and shooting with the 50mm focal length is actually 50mm. However, for the D7100, we must multiply the focal length, 50mm, by the crop factor, 1.5, to determine the visual perspective with which we’re shooting: 75mm. Since the crop sensor chops a considerable amount of sensor away from a full-frame chip’s perimeter, the area of the lens now used can be equated to an 75mm lens on a full-frame sensor. If you are using a crop-sensor camera, multiply any focal length by 1.5 and you’ll find out what the equivalent perspective is on a full-frame camera.

A crop sensor does not actually magnify the focal length of any lens. It simply crops the sides, top, and bottom of the lens’s angle of view. However, crop-sensor cameras are a big hit with folks in the sports and wildlife photography arenas, because compared to a full-frame camera that packs the same resolution (megapixels) as a crop-sensor camera, the crop sensor provides a bit further “reach” when looking at two images of the same size. This is not magnification, just simply the result of two different-sized sensors of the same resolution being combined with the same focal length.

Putting Them in Perspective

So, practically speaking, how does this affect you? It really all depends on which camera you are using. If you are shooting with a full-frame Nikon camera, the focal length of the lens with which you are shooting is going to result in that true perspective. However, on a crop-sensor camera, the perspective you get when putting any lens on the camera is simply not as “wide” as it would be on the former type of camera. There is nothing wrong with a crop-sensor camera. They are more affordable because of manufacturing costs, and many are built with the same structural quality as their full-frame versions. However, the next time you read online that an ultra-wide image was shot with an AF-S Nikkor 16–35mm f/4G ED VR on a Nikon D810, you might consider looking into an AF-S DX Nikkor 10–24mm f/3.5–4.5G ED for your Nikon D5300. At 10mm with this latter combo, you are actually achieving the 16mm perspective of the former’s image.

Wait, we’re not done with this subject yet! To make it even more complicated, Nikon makes a set of lenses designed to work with their DX crop-sensor cameras. Whereas all the Nikon lenses work on both full-frame and crop-sensor cameras, the lenses labeled DX were designed for the DX camera’s smaller sensor. When a DX lens is used on an FX body, the camera automatically crops the image, effectively turning the full-frame body into a cropped-sensor body. The DX lenses are fewer in number, but Nikon tries to accommodate crop-sensor camera owners by offering equivalents to some of the most popular lenses. Typically, DX lenses are more affordable than their full-frame counterparts, but if you are thinking about upgrading your camera body from a crop-sensor to full-frame sensor unit, you might hold out for full-frame glass instead of purchasing a lens that might be limiting in the near future. This is one of the issues of moving to a full-frame sensor camera system: Some, if not all, lenses might also need to be updated (or upgraded) to fit the new camera. Usually, photographers see this as a valuable transition from one system to the other, but it does come at a premium.

4. Autofocus vs. Manual Focus

The majority of lenses being manufactured today are capable of being used in either autofocus or manual focus mode. Nikon does not currently make a single lens for its DSLR cameras that isn't capable of both. To keep costs down and make camera bodies smaller, Nikon removed the autofocusing motor from many of their consumer-level camera bodies and instead put the focusing motor in the lenses. The lenses that have the built-in focusing motor have the designation AF-S, which stands for Auto Focus-Silent Wave Motor. Lenses that do not have this built-in motor cannot autofocus on the D3300 and D5300 camera bodies.

Many, but not all, of the Nikon lenses have a switch on the camera barrel that allows you to switch between manual focus and autofocus. This switch is labeled with M/A and M. In the M/A mode, the camera tries to autofocus as long as the camera is set to autofocus. In the M mode, you have to focus manually by turning the focusing ring no matter what focusing mode the camera is in. For autofocus to work, you have to make sure that both the lens and the camera are in autofocus mode.

Now, if you are a purist, you might be thinking, "Why would I ever want to shoot in autofocus mode?" To which my reply would be, "Why would you ever want to shoot solely in manual focus mode?" There is value in shooting in both modes, and knowing when to move to one or the other will help capture the image you want without undue frustration with your technology.

Autofocus is a fantastic innovation for camera technology—a paradigm shifter. It allows us to be efficient in shooting and more accurate in many cases. When subject matter is in motion, such as a running horse (**Figure 1.8**) or football player, autofocus is an innovation I do not like to go without. My "good" shot rate increases in circumstances where autofocus can be used, as opposed to manually focusing on such subject matter.

ISO 100 • 1/800 sec. • f/5.6 • 400mm

Figure 1.8 Continuous autofocus was necessary for me to capture this horse running fast and at an angle that closed the distance between us. Although possible, manually focusing this event would have presented a few more challenges and a lot more missed shots.

However, there are times when manual focus is indeed your best option. Autofocus in Nikon DSLRs works well when there is enough contrast (the difference between light tones) on or between subject matter that the *camera* is able to detect. There are times when subject matter lacks enough contrast for the autofocus to work properly, leaving you with a lens—and really a camera—searching for focus. Very low-light situations, such as nighttime landscapes, come to mind (**Figure 1.9**). In these instances, flicking the switch on the lens to manual focus puts you in full control of the lens's focusing.

ISO 800 • 30 secs. • f/11 • 17mm

Figure 1.9 For a timed exposure of some adventurous photography students crossing the Llano River, I set my camera on a tripod and switched my lens to manual focus to maintain a steady shot and to keep the lens from "hunting" focus.

Shooting macro (extreme close-up) photography also benefits greatly from manual focus mode. There is nothing more frustrating to this nature photographer than trying to autofocus on the petals of a flower that is occasionally bumped by a soft breeze. Autofocus will continually search for something to focus on, even if the autofocus mode is turned to Single in the camera. This isn't easy on the eyes.

You can also use autofocus and manual focus together to achieve a single image. When shooting landscapes for which you want maximum depth of field, it is often helpful to use autofocus to focus exactly one-third into the scene (more on *hyperfocal distance* in the next chapter) and then switch to manual to keep the same focal plane when recomposing the frame. I do this when I intend to set up for a while—such as capturing a really large thunderstorm or light painting a structure—and want to make multiple exposures without refocusing for each shot.

In the end, using autofocus or manual focus is based largely on user preference. I am in autofocus 90 percent of the time. Over time, I've become used to the different autofocus modes Nikon cameras allow the shooter to use, and I'm extremely comfortable in "AF." However, if manual focus is the wheelhouse in which you find yourself, then use it!

5. Prime vs. Zoom

Speaking of things purists and non-purists alike are passionate about, discussing the difference and overall value of prime lenses versus zoom lenses can cause some photographers to have a conniption. Many times, this argument is focused on which is sharper, lighter, or more true to the roots of photography. Nevertheless, photographers prefer to shoot with one or the other, or a combination of the two.

Prime Lenses

Prime lenses are those that are limited to only one focal length (**Figure 1.10**). The first camera lenses ever were prime lenses, and they are still very popular, especially among those wanting lighter loads and incredibly shallow depth of field. Prime lenses have fewer moving parts than zoom lenses, making them easy to carry around (aside from the super telephoto lenses), smaller (again, aside from the big glass), and less intrusive to subject matter (super telephotos might as well have red flags flying atop). Since they have fewer moving parts, and fewer pieces of glass or lens elements that might be moving otherwise, prime lens are arguably sharper than zoom lenses.

Figure 1.10 Prime lenses, like this 85mm f/1.4, are appealing to many photographers for their wide maximum aperture and build quality.

There are plenty of focus charts online and research on the subject. When you nail focus with prime lenses, especially at very large apertures, they *are* sharp. Perhaps the sharpness is heightened by the extreme bokeh. And when it comes to bokeh, prime lenses cannot be beat. At only one focal length, manufacturing is capable of building lenses that have very wide maximum apertures. Whereas the maximum aperture opening of any zoom lens Nikon makes is f/2.8, some prime lenses open up all the way to f/1.4, a whole two stops more open. Talk about great lenses for low-light conditions and isolating subject matter from an environment!

Prime lenses are not without their issues. Prime lenses, as their name indicates, are limited to just the one focal length. This isn't necessarily a negative, unless you are the type of shooter who requires a range of focal lengths but doesn't have room in the camera bag—nor the budget—for every prime lens available. Prime-lens advocates encourage those wanting the flexibility and convenience of zoom lenses to "zoom with their feet" and move around in the landscape. However, there are times when the prime lens comes up too short or too long, without the ability to change on the fly. This usually happens to me when I'm using telephotos such as the 300mm f/4 or 400mm f/2.8. While I'm shooting football games, these focal lengths are great, until the action comes real close, real fast!

Zoom Lenses

Zoom lenses, on the other hand, offer a range of focal lengths and are many folks' go-to lenses. Consider the AF-S DX Nikkor 18–200mm f/3.5–5.6G ED VR II. For crop-sensor camera users, this lens offers enough range for 90 percent of their work. On top of that, it's fairly light and much smaller and less expensive than the AF-S Nikkor 70–200mm f/2.8G ED VR II and the popular AF-S Nikkor 24–70mm f/2.8G ED.

Zoom lenses come in all shapes and sizes, and if you just bought a Nikon D5300 or another crop-sensor camera, you more than likely combined it with Nikon's standard kit lens, the AF-S DX Nikkor 18–55mm f/3.5–5.6G VR. Many folks also purchase an AF-S DX Nikkor 55–300mm f/4.5–5.6G ED VR or the affordable telephoto zoom, the AF-S VR Zoom-Nikkor 70–300mm f/4.5–5.6G IF-ED. With just two of these lenses, a shooter has an entire bag full of prime focal lengths—and more—at her disposal. Personally, I carry an AF-S Nikkor 24–70mm f/2.8G ED the majority of the time, and when I'm on an assignment where I expect a variety of shots and perspectives, I carry an AF-S Nikkor 70–200mm f/2.8G ED VR II attached to an additional camera body.

However, zoom lenses are anything but invisible. If your goal is to be inconspicuous in a crowd, a long telephoto zoom is probably not the best choice. Higher-end lenses are also much heavier than their prime counterparts, as well as the consumer-level zooms. Nikon has done a great job in previous years of manufacturing lighter lenses, but big zooms are still heavy (part of which helps stabilize some to be handheld). Lastly, zoom lenses cannot reach the maximum aperture openings of many prime lenses. More expensive, higher- end zooms, such as those mentioned in the previous paragraph, can open up to f/2.8, the largest opening of any zoom lens Nikon makes. But this doesn't compare to lower-end, less expensive primes that open up to f/1.8 or f/1.4.

Which One?

Like shooting in manual focus or autofocus, shooting with prime or zoom lenses is a choice based on preference and shooting style. Ultimately, you might have the best luck working with a combination of the two types, if you have room in your camera bag. If I need a lens that offers as much flexibility as I can possibly squeeze out of it, I'll go with a zoom, particularly if I foresee shots made at multiple focal lengths. If I'm needing a lens that does not get in the way, is easy to carry—and more important, doesn't seem aggressive to my subjects—then a prime lens or two is what I will throw in a small bag. The majority of the time, though, I have a bag with a few zoom lenses and a couple of prime lenses.

6. Minimum Sustaining Shutter Speed

This is a simple issue, and more of a tip, when it comes to working with and even purchasing lenses. *Minimum sustaining shutter speed* refers to the slowest shutter speed one can handhold a lens and maintain focus. Any shutter speed slower may incur camera shake and potentially ruin an otherwise great shot (**Figure 1.11**). When shooting with shutter speeds slower than the minimum sustaining shutter speed, it is best to stabilize the camera by placing it on a monopod, tripod, or anything solid. So, how do you determine minimum sustaining shutter speed? The two determining factors are focal length and your own personal stability.

ISO 160 • 1/250 sec. • f/4 • 300mm

Figure 1.11 This shot of a gray fox is out of focus due to my inability to handhold the 300mm lens I was using at 1/250 of a second shutter speed, just a bit slower than the lens's minimum sustaining shutter speed.

Focal Length

The first factor is the most technical and worth keeping in the back of your mind. The minimum sustaining shutter speed is the shutter speed that has a denominator (since shutter speeds are measured in fractions of a second) that is closest to the focal length in which you are shooting. For example, let's say you are shooting at 100mm. Theoretically, a shutter speed of 1/100 of a second is your minimum shutter speed—the slowest you could shoot before your own body shake forces the image out of focus. For a 24mm focal length, 1/30 of a second might work best. For a much longer focal length, such as 400mm, 1/500 of a second might sustain focus.

Personal Stability

A minimum sustaining shutter speed also has a lot to do with your own stability. With experience and technique, and a better sense of balance, some folks can shoot with much slower shutter speeds than those suggested above. When I'm locked in a stable stance, I feel fairly comfortable shooting a 24mm lens, and especially a 16mm lens, at 1/15 of a second. Test your stability while practicing at different focal lengths, slowing your shutter speed down for any given focal length until you notice a big difference. Sometimes you can feel it, but it is best to run through a range of shutter speeds while focusing on the same subject and then review the files on a computer screen. Keep practicing, and your minimum sustaining shutter speed will lower.

Vibration Reduction (VR) is a feature of many lenses in the Nikon lineup (**Figure 1.12**), allowing photographers to shoot with slower and slower shutter speeds. Lenses with VR—such as the AF-S Nikkor 70–200mm f/2.8G ED VR and the AF-S VR Zoom-Nikkor 70–300mm f/4–5.6G IF-ED—contain a mechanism that shifts the optics in a way that stabilizes the unsteady hands of the shooter, especially for precarious shutter speeds. In some cases, Vibration Reduction claims up to four stops worth of VR, an amazing amount of stabilizing when you're in a pinch (**Figure 1.13**).

Figure 1.12 Vibration Reduction (VR) controls on my well-used AF-S Nikkor 70–200mm f/2.8G ED VR lens. Not only can you turn the VR on and off, but you can also set the type of VR used.

ISO 100 • 1/80 sec. • f/2.8 • 105mm Micro-Nikkor

Figure 1.13 It is fairly common to place a camera and lens on a tripod to shoot macro work. Macro lenses with Vibration Reduction help alleviate camera movement, allowing many to handhold these tight shots.

There is no rule stating you must shoot at the minimum sustaining shutter speed. In fact, you should shoot with as fast a shutter speed possible given your aperture and ISO. However, some moments call for shooting with slower shutter speeds, and when they do, it is worth knowing where your minimum sustaining shutter speed exists for the focal length in use.

7. The Lens Trinity

Many photographers who have been at it a while develop an affinity for three lenses: a wide, a standard, and a medium telephoto. In an effort to accomplish as much range with as few lenses as possible, photographers are attracted to this "holy trinity" of glass (**Figure 1.14**). In all practicality, three lenses capable of covering focal lengths from the ultra-wide (less than 24mm) to the medium telephoto (approximately 200mm to 300mm) can make a lifetime of images.

Figure 1.14 The standard lens trinity used by professional photographers: the AF-S Nikkor 14–24mm f/2.8G ED, the AF-S Nikkor 24–70mm f/2.8G ED, and the AF-S Nikkor 70–200mm f/2.8G ED VR II. These three lenses give you a huge range of focal lengths, from 14mm to 200mm, all at a wide f/2.8.

Traditionally, the lens trinity is composed of a lens capable of going extremely wide, such as the AF-S Nikkor 14–24mm f/2.8G ED, a standard zoom lens that moves from wide to just over normal (50mm), like the AF-S Nikkor 24–70mm f/2.8G ED, and one that continues moving toward a longer focal length capable of handling portraiture, sports, and wildlife, such as the AF-S Nikkor 70–200mm f/2.8G ED VR II. These lenses—and really the focal lengths covered—are considered to be the trinity for full-frame cameras, such as the Nikon D4S, D810, D750, and D610 models. These focal lengths are also what many of the DX lenses—made for the DX crop-sensor camera bodies—are designed around when taking into consideration the cameras' crop factors.

A lens trinity for a Nikon DX camera may look more like the AF-S DX Nikkor 10–24mm f/3.5–4.5G ED for the ultra-wide zoom, an AF-S DX Nikkor 18–55mm f/3.5–5.6G VR for the standard zoom, and the AF-S DX VR Zoom-Nikkor 55–200mm f/4–5.6G IF-ED for the telephoto zoom (Figure 1.15). This doesn't mean the so-called full-frame trinity does not work on your crop-sensor camera bodies; you just wouldn't be able to take advantage of the visual perspective the wider lenses offer—which when factoring in the crop factor of DX bodies equates to trinity-esque focal lengths for a full-frame system.

Figure 1.15 A lens trinity for a Nikon DX camera may look like this: the AF-S DX Nikkor 10–24mm f/3.5–4.5G ED, the AF-S DX Nikkor 18–55mm f/3.5–5.6G VR, and the AF-S DX VR Zoom-Nikkor 55–200mm f/4–5.6G IF-ED.

The lens trinity is arguably the most popular set of lenses for those starting out in photography as well. Read online gear forums anywhere (using caution about some of the information on them) and you'll see many experienced folks encourage new photographers to seek out focal lengths resembling what the trinity offers.

I suggest starting with a standard zoom, which many of you just starting out probably have in an AF-S DX Nikkor 18–55mm f/3.5–5.6G VR if you purchased an Nikon DX camera. From there, I advise getting the medium telephoto zoom before the wide zoom, simply because it offers a bit more versatility to your shooting and comes in handy when you need the reach—which in my case happens more often than needing to go more wide.

Round out your trinity with an ultra-wide zoom lens. These lenses are usually operated at their maximum widths. There is something really special about shooting at 16mm on a full-frame sensor camera, or 10mm on a DX sensor. However, as visually interesting and attractive that focal length is, these types of lenses usually offer the least amount of range and focal lengths. I would lean toward the standard zoom and medium telephoto zoom before plunking down cash for an ultra-wide zoom, based on the sheer amount of images that can be produced with the former two.

8. Investment

By now, you're a few pages into this book, you have read about several different types of Nikon lenses, and learned some essential information about them. And you understand the issues that position certain lenses at different price points. Lenses are more of an investment than the cameras with which they are used. I have lenses that are 15 years old that still work perfectly, but I have replaced my camera many times during that same period. When you buy lenses, you are investing in the future of your photography. Lenses can vary greatly in price, making the buying decision a tough one.

To understand why some lenses are more affordable than others, let's look at the factors that determine price: quality of glass, construction quality, maximum aperture, focal length, and Vibration Reduction.

Quality and Quantity of Glass

All Nikon lenses are made with a level of precision that results from many design, engineering, and performance-testing hours. Nikon is currently the only company in the world that manufactures its lenses from the actual glass all the way to the final product. The Nikkor lenses are each a work of art, blending modern technology with traditional craftsmanship. These lenses are not only meant to produce the sharpest images in every instance but are also styled to create a product you will cherish.

Keep in mind, the bigger the lens, the more glass that is needed and the higher the price. The amount of glass is determined by the focal length and the maximum aperture of the lens. The size of the aperture is a mathematical equation based on focal length, so the wider the maximum aperture, the bigger the lens elements and the more glass that is needed in the construction. There is a reason that the AF-S Nikkor 400mm f/2.8G ED is so expensive; it is a huge lens (**Figure 1.16**).

Figure 1.16 The AF-S Nikkor 400mm f/2.8G ED is a huge lens with really large glass elements, making it a very expensive lens.

Construction Quality

Every Nikon lens is built to exacting specifications, but that does not mean that all the lenses are built the same. Some lenses are aimed at the professional photographer, and some are aimed at the hobbyist. You can usually tell which is which just by the feel and weight of the lens. The lenses made for the consumer market tend to be smaller and lighter, and are not meant to take the same type of abuse that professional photographers' lenses do. The lenses aimed at the professional market tend to have better builds to help protect the expensive internals from the elements. These are lenses meant to stand up to the harshest climates. I have been using the same AF-S Nikkor 70–200mm f/2.8G ED lens for years, and it has performed flawlessly even though the exterior looks a little banged up (**Figure 1.17**).

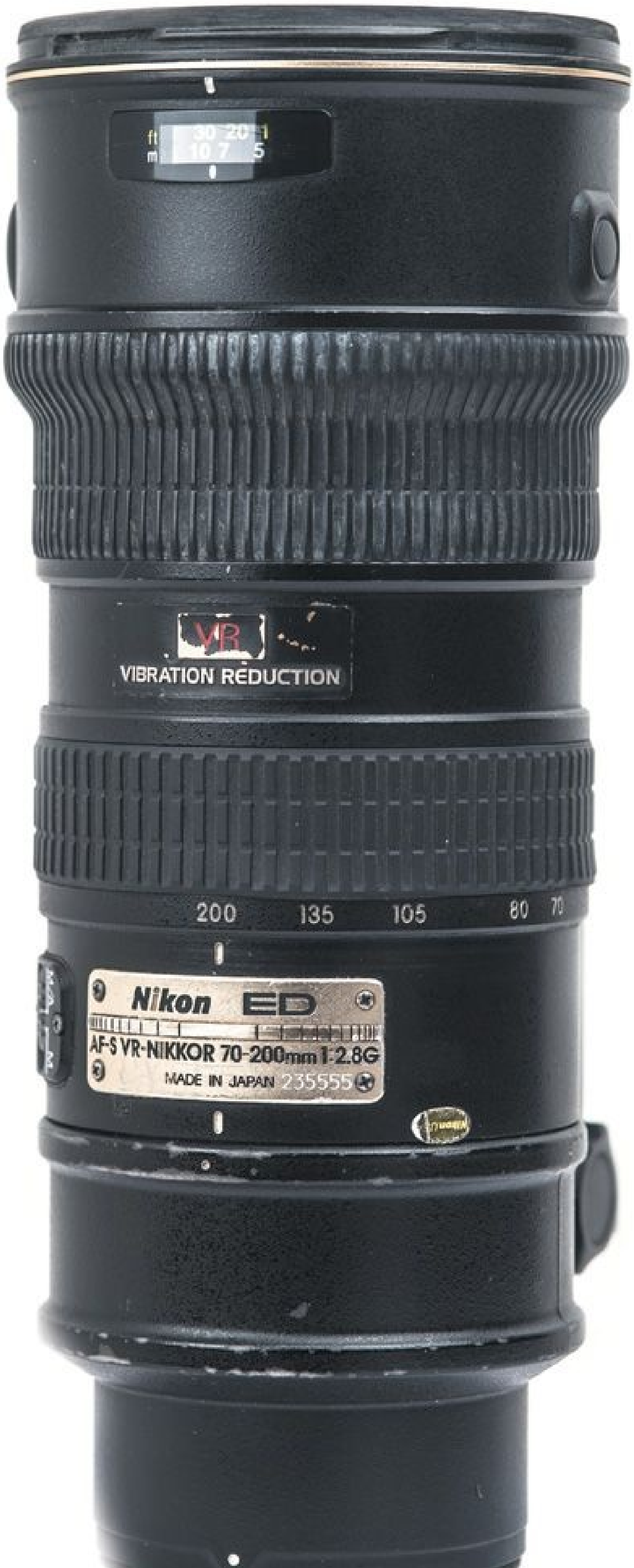

VR
VIBRATION REDUCTION
200 135 105 80 70
Nikon ED
AF-S VR-NIKKOR 70-200mm 1:2.8G
MADE IN JAPAN 235555

Figure 1.17 The workhorse AF-S Nikkor 70–200mm f/2.8G ED is a lens that can stand up to harsh environments and still produce great images. Even as the paint chips a little and the lens shows some wear and tear, it still functions perfectly.

Maximum Aperture

As a general rule, the lenses that have a constant maximum aperture of f/2.8 or wider have a higher-end build quality. They also have a much higher price point.

Let's look at two lenses, the AF-S Nikkor 70–200mm f/2.8G ED VR II and the AF-S Nikkor 70–200mm f/4G ED VR. Both of these lenses cover the same focal-length range and both maintain a constant maximum aperture over that range. The only real difference is in the maximum aperture of each lens, with one lens being a stop faster than the other. There is also a slight difference in the VR technology, with the faster lens having an updated version of the Vibration Reduction technology. The real difference in these two lenses is the price—the f/2.8 version is currently US$1,000 more than the f/4 version.

The maximum aperture opening is a point on which many people base lens purchases, but it is important to consider your own applications for different lenses. For example, Nikon makes an AF-S Nikkor 16–35mm f/4G ED VR, which is considered to be a fantastic ultra-wide zoom, great for everything from landscape to editorial photography. However, if you are primarily a landscape photographer, where f/4 might not be used as much as more closed-down apertures, you might consider the AF-S Nikkor 16–85mm f/3.5–5.6G ED VR. It is still a high-quality lens, but with f/3.5–5.6 as its maximum aperture opening, it contains less glass and is US$500 less.

Vibration Reduction

Another technology that increases the price of certain lenses is Vibration Reduction, discussed later in the book. For those with unsteady hands or who work in low-light environments, this price difference may be worth it. It is technology that only gets better as it advances, and the Vibration Reduction available on some lenses currently offers up to four stops of stability. VR increases the size and weight of the lens due to the internal mechanism that controls the technology, so take that into consideration when adding to your lens kit.

As with most tech products, today's innovations in professional-grade equipment tend to transfer to consumer-level gear over time. Vibration reduction is a great example of trickle-down technology. It is now used in many of the lenses in the Nikon line, including many of the DX lenses. Fortunately, no matter what your budget, you are more than likely able to enjoy some of the largest innovations in lens construction and operation of all time in Nikon lenses, at all price points.

Buying New, Buying Used

Lenses are long-term investments when it comes to acquiring photography gear. Therefore, many folks (including myself) deliberate quite a bit over purchasing glass. One of the burning questions is whether one should purchase new or used.

There are several advantages that come along with buying new, all of which are similar to purchasing any new technology. New lenses offer up the latest and greatest technology to aid the photographer in the image-making process. Buying new from a reputable retailer usually means you get a warranty for the gear (go ahead and register your newly purchased gear at https://support.nikonusa.com/app/product_registration).

Like insurance, the warranty is for those “you never know” moments. However, unlike extensive insurance, warranties typically do not cover all types of damage to newly purchased lenses, so be sure to read the fine print. Buying new also means you can assume you are obtaining a pristine copy of the lens, free of defects, and if it isn’t, the warranty comes in handy.

Finally, new and recent versions of lenses also come with support from Nikon and Nikon Professional Services (NPS). For the most part, Nikon Professional Services is available for those who make a living using Nikon photography gear, including professional-grade lenses.

The drawback to buying new glass, however, is the expense. The primary reason to buy used is simply to save money. I have nothing against buying used glass. In fact, half the lenses in my kit were purchased used. However, there are a few things to consider before plunking down money for used glass. First, make sure you are shopping from a reputable vendor (some of which might even offer a warranty for used gear). I am a fan of B&H Photo (www.bhphotovideo.com) and Adorama (www.adorama.com), both of which have great used departments with many options from which to shop. In the business for many years, KEH (www.keh.com) is another resource. Also consider photography rental businesses, such as LensRentals.com. I have purchased used lenses from them and would not think twice about doing it again. They have great customer service, and both lenses I purchased were in exquisite shape when shipped to me.

This brings me to the second point to consider when buying used: lens condition. All of the above vendors thoroughly check the equipment they intend to sell before it is put on the market, and each of them has a very similar condition rating for their products. When shopping for used gear online, be sure to consult the descriptions for each value used to rate lens conditions, and if you have any questions, contact the seller.

I prefer to buy used lenses that have no scratches on the front or rear elements and show little to no sign of wear on the barrel. Scratches on the lens elements may not show up when the aperture is set to wide open, but they may begin to appear the more you stop down the aperture to achieve greater depth of field. Although wear on the lens barrels may not matter too much to some, it might indicate some internal wear as well, as a result of being knocked around or dropped. I also want lenses on which all of the rings (zoom and focus) operate appropriately and the autofocus and Vibration Reduction (if included) work well.

If you are purchasing from a local colleague or a friend, check for those issues mentioned above, but also spend some time with the lens(es). Ask to handle and possibly field test the glass before making a purchasing decision. Used lenses (and used camera gear in general) are much like used cars. Some have more mileage than others, some do not have as many or the newest features as others, and normal wear and tear needs to be taken into consideration. Overall, though, doing your research and smart shopping will most likely land you great versions of the lenses you want without paying for new.

Renting

Renting camera gear, especially lenses, is a relatively new opportunity for folks to get their hands on all types of equipment. Two reasons for which you might consider renting a lens: needing it for a one-time-only shoot or photographic experience and testing a lens you are considering purchasing. I do not have much need for an AF-S Nikkor 85mm f/1.4G, but occasionally I will rent one for a few days for a fraction of the price it costs to purchase a new *or* used version.

If you are comfortable with the lens kit you have for your Nikon DSLR, but occasionally want to shoot with another perspective, renting is a great alternative. It is even a smart alternative to borrowing a friend or colleague's lens because most rental services offer insurance in case of an accident. If you scratch the front lens element of your buddy's new AF-S DX Nikkor 18–300mm f/3.5–5.6G ED VR lens, you might be obligated to replace it for much more than the nominal insurance fee.

If you are thinking about buying a new or used lens, especially one of the more expensive lenses, consider renting it first for a few days. Use it extensively during the time you have it, putting it through its paces with your shooting style. This trial period will hopefully inform your purchasing decision. Remember that 85mm I was just talking about? After renting one, I didn't buy it. However, after trialing an AF-S Nikkor 50mm f/1.4G, I was convinced that it belonged in my bag, resulting in a visit to my local camera store.

So, where do you go to rent lenses? Check locally for any camera shops that rent. Many smaller shops are adding rentals to diversify their business, and with renting locally comes a level of support that few non-local entities can achieve. There are also several great online rental services, such as LensRentals.com, LensProToGo (www.lensprotogo.com), and BorrowLenses (www.borrowlenses.com). I have been a LensRentals.com user for years (several of the images in this book were made with gear I rented specifically for it). Online rental services usually offer more gear and also make it easy for the renter to return lenses back to headquarters.

Conclusion

Lenses, as opposed to many camera bodies, are long-term investments in your photography kit. Since 2004, I have owned six camera bodies as my primary workhorses (probably not many by some professionals' standards, but enough), and a few more as backups. In that time, I have owned only one version of every lens I have purchased. I bought my first really fast glass in 2005, a used AF-S Zoom-Nikkor 17–35mm f/2.8D IF-ED, and I don't see myself selling it or trading it in anytime soon. It's still sharp, functions like new, and I think it flares less than newer ultra-wide lenses. It is easily the oldest lens I own, and the rest of my "trinity" isn't too much younger.

The point is that lenses can offer you many more years of photography than a digital body. Depending on the model, a newer version of a camera body can be released what seems like every year. Lenses, because the technology does not change as frequently, have much longer shelf lives than cameras. Even though camera bodies cost more than lenses in some cases, the glass is where you see your kit really develop due to its longevity.

Lens investments are informed by our own personal, professional, and stylistic needs. Want to upgrade that kit lens immediately after purchasing your first DSLR combo kit? Spend a bit more time with it to see if the investment is necessary. I'm not one to encourage going into debt over photography; instead, consider your purchase options and your own style/needs to make an informed decision about the lenses you acquire.

Chapter 1 Assignments

Let's start the book's assignments by doing some homework and getting in some practice.

Get the manual out

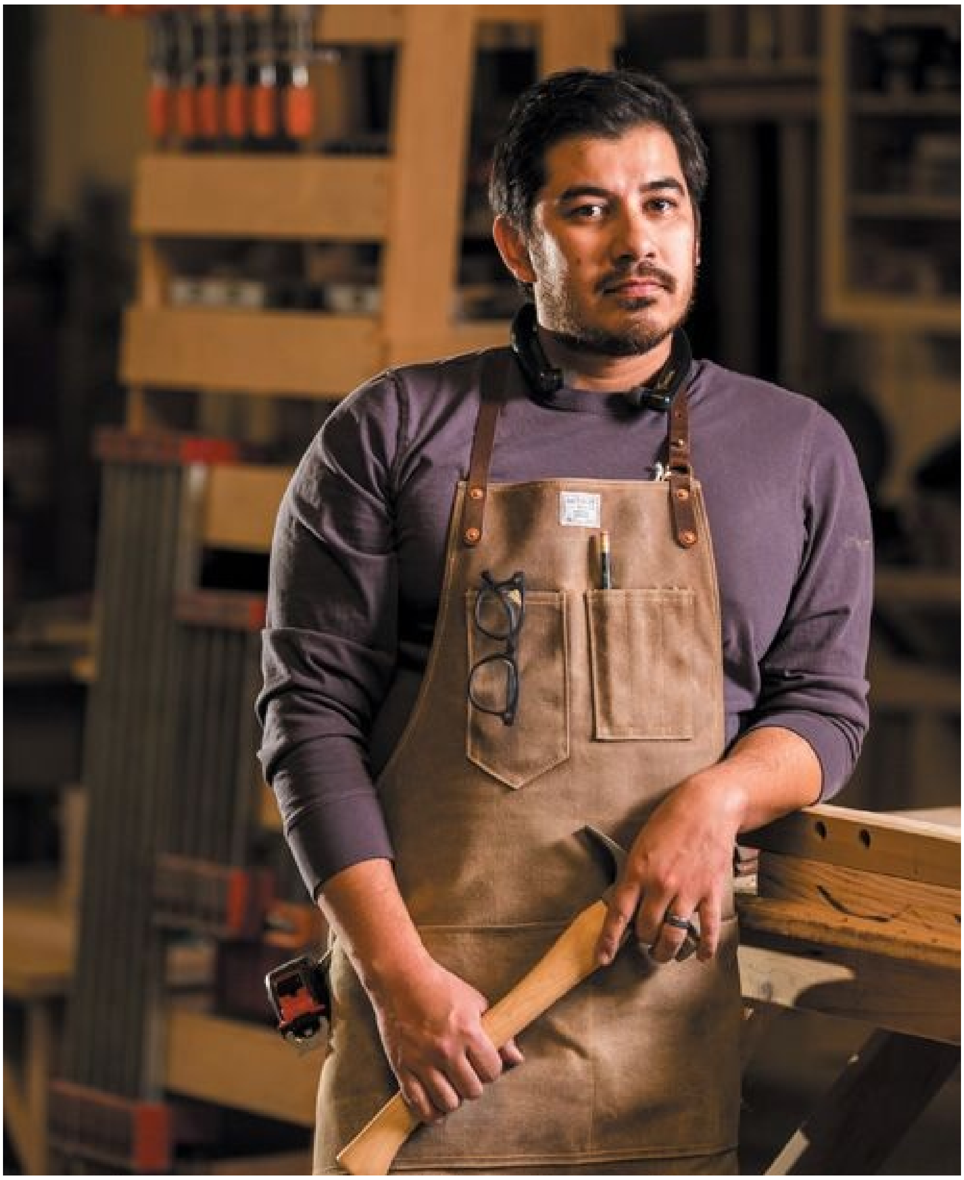
There are many different Nikon lenses, and all share the same basic functions. However, many have unique differences. Pore over the technical manual, familiarizing yourself with the features of a lens (many of which we cover in this book). At the same time, have the lens near you and handle it as you read about it. Getting accustomed to the size and form of the gear you use is essential to working with it efficiently, effectively, and more important, creatively.

How slow can you go?

Test out the minimum sustaining shutter speed you are capable of shooting with for various focal lengths. Choose any lens to which you have access. Perhaps it's the kit lens that came with your camera. Shoot at set focal lengths, such as 18mm, 24mm, 35mm, and 50mm (you can use any focal length you want). For each, test how slow you can shoot before the image becomes out of focus due to camera shake. Be sure to turn Vibration Reduction off, and handhold the camera and lens. To be sure of focus, download the images later on the computer, and zoom in to see if and how blur occurs at slow shutter speeds.

Share your results with the book's Flickr group!
Join the group here: www.flickr.com/groups/nikonlenses_fromsnapshotstogreatshots

2. Depth of Field and Perspective



ISO 400 • 1/200 sec. • f/2.8 • 125mm

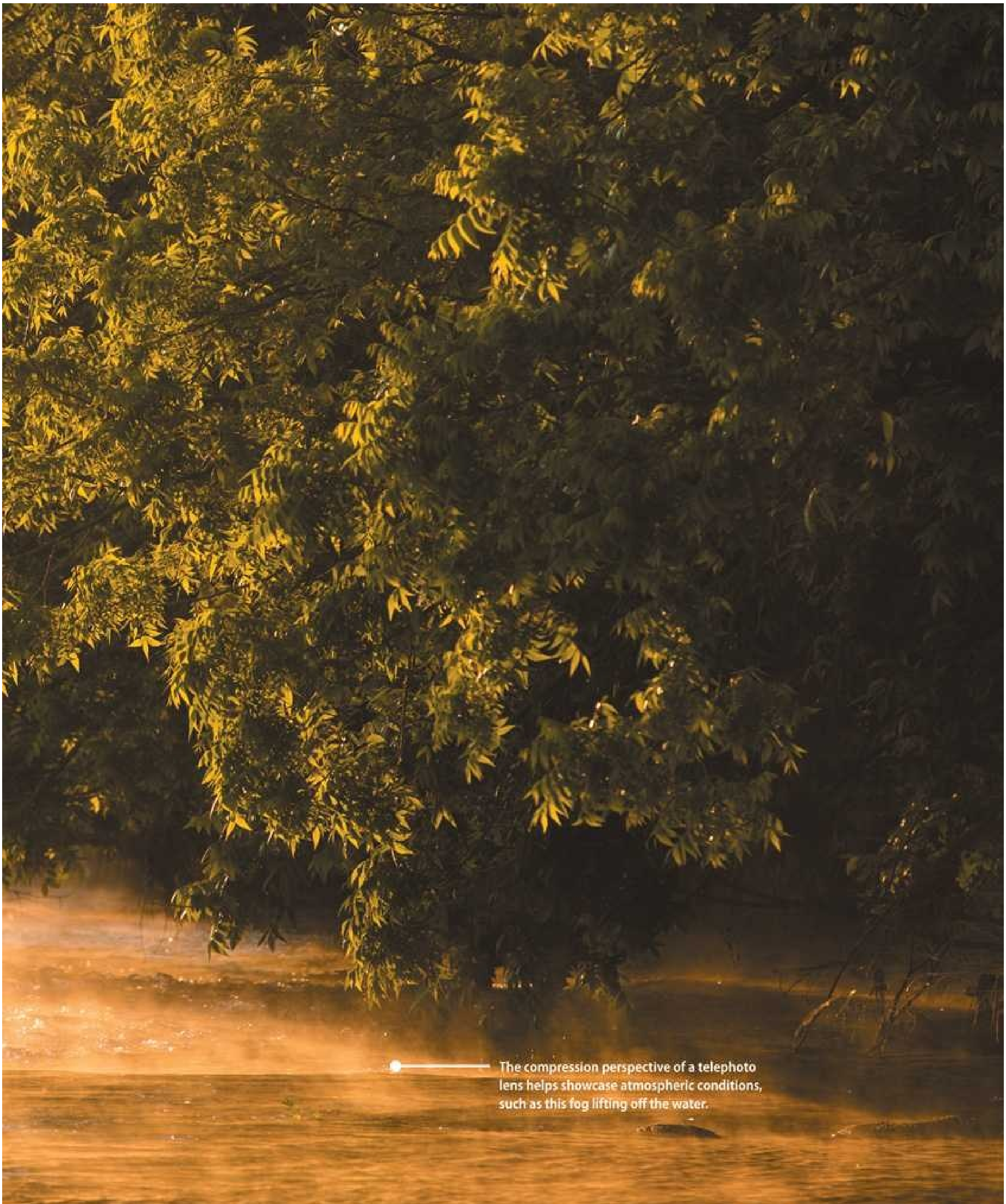
Using the visual controls of the lens

My favorite exposure mode is Aperture Priority (A). I'm in this mode 80 percent of the time, moving to Manual (M) when I'm shooting in the studio and at times when exposure is a bit tricky for the camera's metering. However, I'm not in Aperture Priority because it's an automatic mode that does most of the heavy lifting with metering. Instead, I like Aperture Priority because I *think* and *see* in terms of the aperture and depth of field when sizing up potential shots. The ability to affect an image's depth of field with the flick of a switch and take advantage of one of photography's most important aesthetic controls is exciting—you'll benefit from becoming more comfortable working the aperture. This chapter covers the relationship between aperture and depth of field, hyperfocal distance, and how to make your photos more interesting using different perspectives.

Poring Over the Picture

ISO 100 • 1/200 sec. • f/5.6 • 200mm


I used a larger aperture to obtain shallower depth of field, leaving most everything behind and in front of the focal plane out of focus.
I used a longer focal length to isolate a smaller section of the sunrise-lit river, compressing the foreground into the background and creating a distanced pattern in the foliage.



The compression perspective of a telephoto lens helps showcase atmospheric conditions, such as this fog lifting off the water.

Plane of Critical Focus and Aperture

The aperture, aside from the opticalgrade glass and the barrel containing a lens's internals, is probably the most important mechanism of any lens. To be specific, the aperture is a set of overlapping metal leaves forming a ring within the lens, closing or opening depending on the user's or camera's determined settings. We colloquially call this opening and closing of the aperture "stopping" up or down. The aperture controls two things: depth of field and how much light is allowed through the lens to expose on the camera's sensor (or film). The aperture is just one of a few items that make up the formula for exposure; many folks use the aperture and shutter speed together for a desirable exposure. For the purposes of this chapter, we will look at aperture as it relates to depth of field (**Figure 2.1**).

ISO 400 • 1/800 sec. • f/1.8 • 85mm

Figure 2.1 The aperture is the direct control of depth of field, which allowed me to place the curves of the fern's leaves in tack-sharp focus and everything else out of focus.

Aperture and Depth of Field

Before we delve into depth of field, we need to cover the *plane of critical focus*. Remember planes? Not the flying variety but rather the theoretical mathematic concepts you learned about in geometry? They are invisible, yet infinite, having no thickness but encompassing theoretical real estate that sprawls forever in space. The plane of critical focus is no different, and it is highly relevant when talking about focus and depth of field. Often referred to as the focal plane, the plane of critical focus is simply where focus is placed into an image. When you focus on a subject—manually or by using autofocus—this invisible plane exists at the very point at which you focused.

The plane exists parallel to the optics in the lens, and therefore the sensor in the camera, and it is positioned exactly perpendicular to the direction in which the lens is pointed. Anything existing on the plane of critical focus in an image (and theoretically everything on it outside the frame) is in focus (**Figure 2.2**). If you move exactly sideways in either direction, the plane stays at the same position, and everything that exists on the plane remains in focus. Not so if you move forward or backward. The plane then shifts accordingly, and what was once in focus—that which existed on the plane previously—is now out of it.

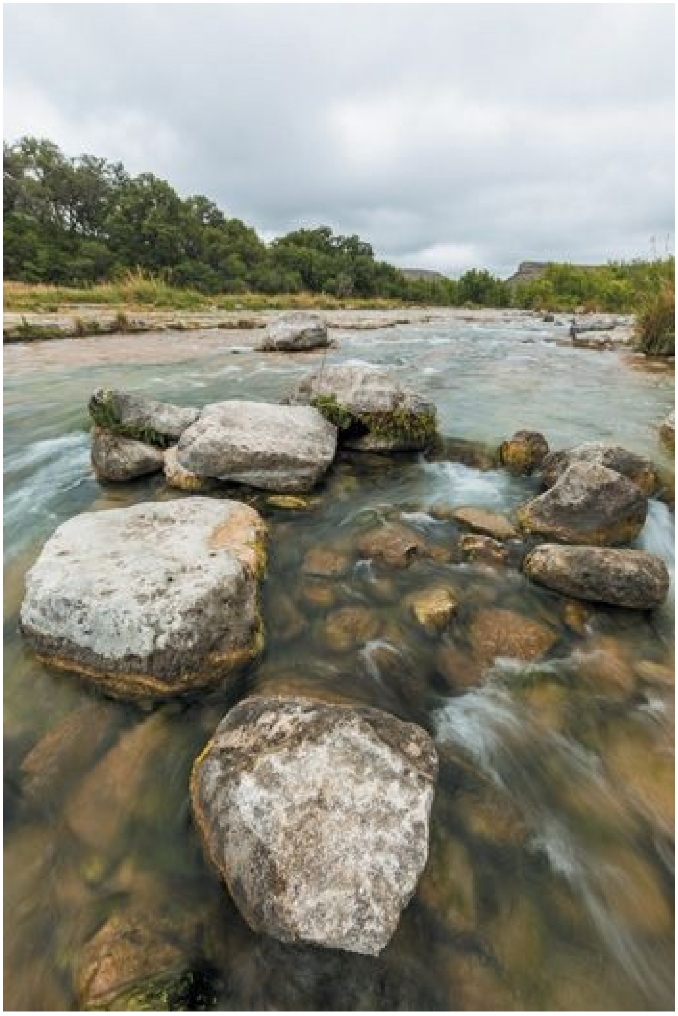
ISO 200 • 1/80 sec. • f/4 • 300mm

Figure 2.2 At f/4 and at 300mm, only a few feet of these two rows of cotton are in focus, the area that surrounds where I placed the plane of critical focus.

Unlike theoretical planes in geometry, though, we can manipulate the “thickness” of the plane of critical focus to adjust how much is actually in focus. This is where depth of field comes into play, as well as the aperture.

Depth of field is the amount of a shot that is noticeably in focus. It is called *depth* of field because it exists around the plane of critical focus. Technically, you do not adjust the thickness of the focal plane, but when depth of field is increased, areas in front of and behind the plane itself come more into focus. When depth of field is decreased, less of these areas is in focus. We commonly describe large amounts of depth of field as wide and small amounts as shallow (note: you probably hear “shallow” used more often than “wide”).

Landscape photography (**Figure 2.3**), where it is typical to have everything in sharp focus, regularly employs large amounts of depth of field. Conversely, shallow depth of field is used extensively in portrait photography (**Figure 2.4**), where the person or animal in the shot is in focus, but the background—and foreground, if you can see it—is thrown out of focus to help isolate and draw attention to the subject.



ISO 100 • 1/4 sec. • f/22 • 14mm

Figure 2.3 **Landscape shots like this one regularly employ a closed-down aperture, resulting in maximum depth of field, where everything from the foreground to the background is sharp.**

ISO 400 • 1/100 sec. • f/2.8 • 185mm

Figure 2.4 With an aperture value of f/2.8 at 185mm, there isn't very much in focus except the subject's left eye, where the focal plane is placed.

The mechanism used to adjust depth of field is the aperture. To increase—or widen—the depth of field in a shot, a photographer can decrease the physical size of the aperture. To produce shallower depth of field, a photographer can open up the aperture. What does this look like to the operator? Aperture values are represented by the number in the viewfinder or on the LCD screen containing a decimal. Aperture values are technically denoted as f-stops, which are ratios between the lens's focal length and the physical size of the aperture opening within the lens. Meaning that even though the same aperture values exist for other lenses, the numbers are specific to each lens. Typical aperture values range from f/3.5 (or f/2.8 or f/1.4, depending on the lens) to f/22 or f/32.

Practically speaking, the lower the aperture value is, the shallower the depth of field (**Figure 2.5**). Inversely, the more closed, or stopped down, the aperture, the more depth of field one gets in a shot (**Figure 2.6**). Here's the counter-intuitive part: Shallower depth of field (meaning a larger aperture opening) is achieved with lower aperture values, and wider depth of field (a smaller aperture opening) is achieved with higher aperture values.

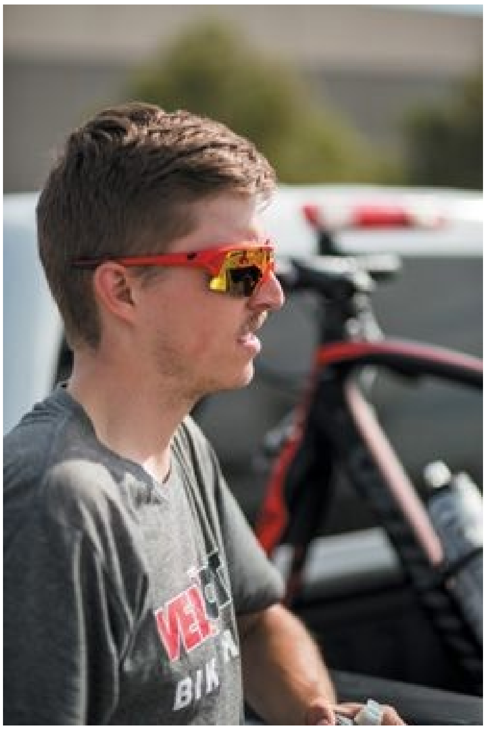
ISO 100 • 1/1600 sec. • f/2.8 • 64mm

Figure 2.5 **Shallow depth of field (aperture value of f/2.8) throws everything beyond the tallest flower in the shot pleasingly out of focus.**

ISO 200 • 1/400 sec. • f/8 • 64mm

Figure 2.6 At f/8, the flowers in the background come more into focus as a result of greater depth of field.

For the landscape example above, an aperture value of f/22 closes the physical aperture down so much that the depth of field is nearly infinite. A typical portrait, however, might employ an aperture value of f/5.6, f/4, or f/2.8 to create very shallow depth of field. Many lenses—and cameras—allow you to adjust aperture values by 1/3-stop increments, offering you finer controls for both exposure and depth of field than did older all-manual film cameras. It is worth running through the range of aperture values your lens has and getting a sense of how each affects the shot (**Figures 2.7** through **2.10**).



ISO 100 • 1/6400 sec. • f/1.8 • 85mm

Figure 2.7 Compare aperture values for Figures 2.7 through 2.10, and notice how the bicycle and pickup truck come more into focus behind cyclist Cody Hale as they close down.

ISO 100 • 1/1250 sec. • f/4 • 85mm

Figure 2.8 At f/4, the depth of field grows beyond just the camera side of Cody’s face, and the background is more discernible.

ISO 100 • 1/320 sec. • f/8 • 85mm

Figure 2.9 The depth of field is wide enough now to see that the background is the back of a pickup truck and the front of a bicycle.

ISO 100 • 1/80 sec. • f/16 • 85mm

Figure 2.10 At f/16, the depth of field has grown so much it has become a distraction in the shot.

To run this experiment, simply frame up a shot for which you can focus on a stationary subject and make several exposures, adjusting your aperture value higher each time you shoot a new frame (you might benefit from placing your camera on a tripod and switching the focus over to Manual). Look at the change in the background for each shot, noticing that it comes more into focus the more closed, or stopped down, the aperture becomes.

Keep in mind that for every adjustment you make to the aperture, you will likely have to adjust your shutter speed (if you are shooting in Manual exposure mode).

Distance and Depth of Field

The aperture is not the only thing that can visually affect depth of field. Although the aperture is the only mechanism we can manipulate in-camera to control depth of field, physical distance between the subject and shooter also impacts how much of a shot is in focus.

At any given aperture and focal length, the closer you are to the primary subject (for example, a portrait subject), the more the depth of field drops off as long as you maintain your plane of critical focus on the subject (**Figures 2.11** and **2.12**). The opposite is true the more you move away from the subject, when you gain depth of field. Technically, it has nothing to do with the distance of the subject from the shooter but rather the distance of the focal plane from the lens. When the focal plane is closer to the lens, there is less depth of field, even if the lens is stopped down all the way to f/22. However, the farther away the focal plane is from the lens, the more relative depth of field is gained, or at least visually apparent, even when the aperture is wide open. This has much to do with the relative size of the subject in the frame as well, which will be discussed later.

ISO 100 • 1/80 sec. • f/2 • 50mm

Figure 2.11 Compare the backgrounds of Figures 2.11 and 2.12. The closer the lens is to the subject at 50mm and a constant aperture, the more out of focus the background becomes.

ISO 100 • 1/80 sec. • f/2 • 50mm

Figure 2.12 When the lens is farther away from the subject, the background comes more into focus, even at f/2. Compare the windows of the building.

An additional factor that affects the *appearance* of depth of field is the subject's distance from a background. Portrait photographers like to place their subjects against interesting backgrounds, like colorful walls or cascading plants in a garden (**Figure 2.13**). The closer the background is to the subject, the more it will appear in focus, even if the photographer is using an aperture of f/2.8 or lower. Even at large apertures such as f/2.8, f/2, and f/1.4, depth of field does not fall off immediately, albeit more drastically than at more closed-down apertures. In some cases, that nice background you wanted for ambience can instead be a distraction, unless you pull your subject off of the background more. Increase the distance between the subject and the background, and then see what you get (**Figure 2.14**).

ISO 400 • 1/160 sec. • f/4 • 65mm

Figure 2.13 A martial arts instructor poses approximately 7 feet away from a wall containing his certifications, which appear slightly out of focus due to a large aperture setting.

ISO 400 • 1/50 sec. • f/4 • 67mm

Figure 2.14 **When I moved him forward 3 feet, the wall and certifications appeared more out of focus, with the shift of the focal plane—on the subject’s eyes—closer to the lens and away from the wall.**

Do Lenses Have Inherent Depth of Field?

It is common to hear photographers say that lenses have different inherent levels of depth of field based on their focal lengths. Visually, this makes sense when you start comparing images shot at different focal lengths with the same aperture value. Wider focal lengths produce images that seem to have more depth of field at the same aperture than do longer focal lengths. A shot made at f/5.6 at 18mm appears sharper all the way through than does a shot at f/5.6 and 200mm. From a practical perspective, this is great information and may well inform our own decisions on how to visually size up a shot. However, this information is technically flawed.

Wider-angle lenses seem to offer more depth of field than their longer relatives at the same aperture simply because of the size relationship between the lens and the subject, as well as the optical perspective different types of lenses exhibit (more on perspective later in the chapter). When you are shooting from the same distance to the subject (be it a single person or a complex landscape), using a wider focal length produces a frame in which the subject is significantly smaller—everything is smaller—than if you were shooting at longer focal lengths. As a result of the wider *perspective*, everything in an image shot at a wider focal length from the same distance as a longer lens looks more in focus. However, the depth of field will be the same relatively.

Hyperfocal Distance

At times, achieving maximum depth of field is appealing (**Figure 2.15**). Many of the world's famous landscape, architecture, and street photographs were made with all of their content in focus, from the closest foreground content to the farthest background subject matter. Achieving maximum depth of field like this is often referred to as *hyperfocal distance*, and it is another one of those "tricks of the trade" to add to your bag of techniques.

ISO 50 • 4 sec. • f/22 • 31mm

Figure 2.15 Everything from the closest waterfall to the mountaintop in the background is in focus, illustrating maximum depth of field, or hyperfocal distance.

Hyperfocal distance actually refers to the distance at which you can place your focal plane and render everything in the frame sharply. Although there is a great deal of optical science defining hyperfocal distance, that distance is basically one-third of the distance *into* the scene in which you're shooting. For example, if you were shooting into a room that measured 100 feet long, you would focus at about 33 feet. Easy enough, right? Well, you're probably not photographing in 100-foot-long rooms very often. You are looking off into canyons, photographing people walking down a street that has no end, and shooting macro images of flowers in a field. All instances offer up varied distances in which to shoot, leaving you to take a visual stab at where a third of the distance into the scene may be (**Figure 2.16**).

ISO 100 • 1/10 sec. • f/22 • 170mm

Figure 2.16 With the aperture stopped down all the way on a telephoto zoom lens, I tried to focus one-third of the distance into the entire scene (indicated by the red arrow) to ensure maximum depth of field.

On top of focusing a third of the distance into a scene for maximum depth of field, you need to make sure the lens's aperture is stopped down all the way. For most lenses, this means stopping down to f/22. Combining appropriate hyperfocal distance focusing and stopping the aperture down all the way will result in a sharp image throughout.

I've learned over the years that achieving hyperfocal distance is a bit easier (and more common) with wider focal lengths. They are less sensitive to minute adjustments of the focus ring—adjusting the ring on a telephoto lens may mean shifting focus dozens of feet, versus inches with a wide-angle lens. Wider focal lengths are often used in situations where maximum depth of field is desired, such as landscape photography.

Keep in mind that although you can use autofocus to focus one-third of the distance into a scene, it might be less frustrating to use manual focus. Additionally, shots like Figure 2.16 often require the use of a tripod, particularly when stopping the aperture down all the way means shooting with shutter speeds slower than the minimum sustaining shutter speed (see Chapter 1).

Depth of Field Preview Button

Wish there was a way for you to check out how much depth of field you will achieve before you push the shutter button? Sure, you can always snap a test shot and zoom in to the LCD display to check your focus throughout the image. However, it's nice to know that your Nikon camera may have a way to check the depth of field before you even put your finger on the shutter. It is called the Depth of Field (DOF) Preview button, a small button located beside the lens on the camera body. A DOF Preview button is not available on certain consumer-grade Nikon cameras, such as the D3300 and the D5300, so check your camera's manual to see if you have this function.

When you press the DOF Preview button, the camera tells the lens to stop down to the selected aperture. At this point, you can look through the viewfinder (I usually hit the DOF Preview button while my eye is already at the viewfinder) and see how much of the image will be in focus. You'll notice as you press the button, the image in the viewfinder will dim. This is a result of the aperture closing down to the selected aperture, potentially restricting the amount of light passing through the lens into the camera. The dimming does not have anything to do with the shot's exposure. However, in pressing the DOF Preview button, you are able to see what will appear sharp in an image and what will be soft due to the amount of depth of field.

I use the DOF Preview button frequently, especially with environmental portraits and landscape photography. I consider it one of the more valuable functions of the camera and lens combination. It is also particularly helpful for macro photography, where it seems the depth of field drops off drastically, no matter which aperture you use.

Perspective

In addition to considering the aperture—more specifically, depth of field—when I size up a shot, I envision its perspective before composing within the frame. Perspective refers to the size of and spatial relationships between objects in a two-dimensional image. Photographers use different perspectives to accomplish many things, one being to provide the viewer with a more three-dimensional perception of their work. When it comes down to it, photographs are dimensionally flat, but lenses, in conjunction with good composition, allow us to augment this feeling. Just as compositional technique emphasizes use of foreground, midground, and background to guide the eye through a shot, perspective deals with the size of the foreground to the midground and background, as well as the perceived distance between the three. Although it changes as focal lengths change, there are three categories we typically use to discuss perspective: expansive, compressed, and normal.

Expansive Perspective

The quintessential landscape shot is created with an ultra-wide-angle lens (think of the AF-S Nikkor 14–24mm f/2.8G ED or the AF-S DX Nikkor 10–24mm f/3.5–4.5G ED) pushed in close to a strong foreground subject, like an iconic plant or repetitious linear elements (**Figure 2.17**), with a sprawling mountain scene comprising the midground and background, topped off with an impressive sky that seems to stretch on forever. In this shot, the foreground looks to be miles away from the background structure, as well it might be, and it is so wide that you might as well be *in* the shot as opposed to looking at it. This feeling is closely associated with the type of perspective wider focal lengths offer: expansive.

ISO 100 • 1/60 sec. • f/14 • 14mm

Figure 2.17 This extremely wide desert landscape shot emphasizes and exaggerates the size of the foreground, expanding it toward the camera.

Typically, focal lengths ranging from 10mm to 35mm provide an avenue to achieving expansive perspective. Several visual characteristics help highlight this common look. The first is that foreground subject matter—objects that are within several feet of the photographer—will appear much larger than subject matter of much larger size in the background (**Figure 2.18**).

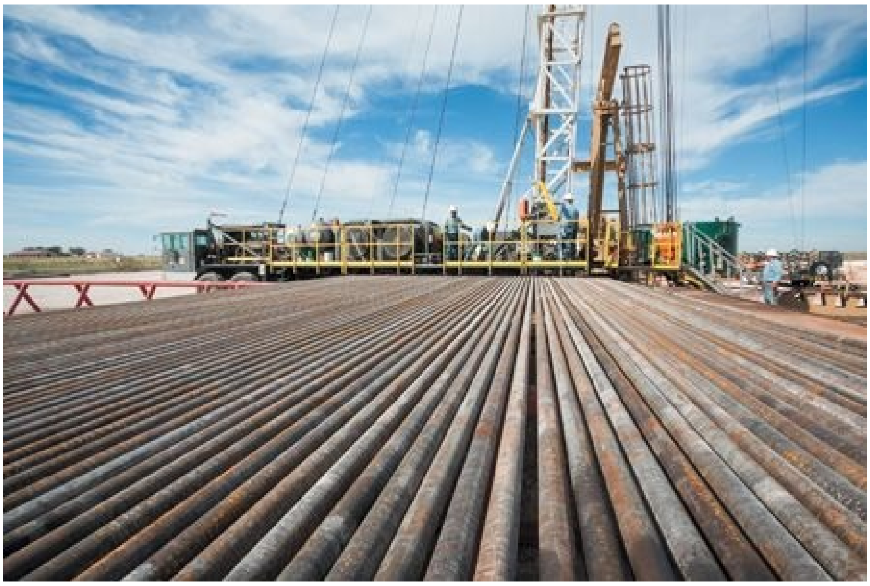
ISO 100 • 1/640 sec. • f/2.8 • 24mm

Figure 2.18 A wide-angle lens pushed in tight on the foreground makes it look like the man facing the camera is playing with a giant!

Want to drive visual significance toward a relatively small object while still showing off its environment? Throw on a wide-angle lens (**Figure 2.19**). Immediately, you will create the signature expansive distance between foreground, midground, and background subject matter that is associated with such lenses (**Figure 2.20**). The wider the lens, the larger the distance between points in the frame.

ISO 100 • 1/640 sec. • f/2.8 • 24mm

Figure 2.19 The value in a wide-angle, expansive perspective is its ability to showcase an important subject, like this irrigation head, and its relative environment.



ISO 200 • 1/60 sec. • f/22 • 17mm

Figure 2.20 Expansive perspective exaggerates distance between foreground and background, making these oilfield pipes seem longer than the rig in the mid-ground is tall. Truth be told, they are shorter than the vehicle.

I often use wider focal lengths, which result in expansive shots. I enjoy how you can drive so much attention to a particular part of the frame while also including the world around it for context and storytelling purposes (**Figure 2.21**). However, expansive perspective is not without its drawbacks.

ISO 100 • 1/640 sec. • f/5 • 17mm

Figure 2.21 Pushing a wide-angle lens close to an active subject, such as this hummingbird researcher netting birds, engages viewers with the setting as if they were standing right there.

Distortion

All of the perspective goodness highlighted above can be considered serious optical distortion in some instances. In creating an expansive perspective, one is exaggerating the actual size and distances of subject matter in the frame. There are certain areas of photography where this is less acceptable or appropriate, such as in architectural and commercial photography (**Figure 2.22**), or even in areas of photojournalism.

ISO 100 • 1/250 sec. • f/7.1 • 18mm

Figure 2.22 As interesting as the expansive exaggeration is, it distorts the length and, subsequently, the shape of the photography drone, as well as the length of photographer Kris Barton's legs.

Expansive perspective is also considered taboo in many portraiture circles. Consider for a moment the plight of a bride's nose if you pushed a 16mm lens close up on her face. The bride might not appreciate how her nose stretches and curves toward the outside of the frame as it follows the convex form of the lens elements, or perhaps the way her nose seems to bulge toward the viewer if she is facing into the frame. The distortion is caused by the actual curvature of the glass elements in the lens (**Figure 2.23**). They are responsible for this great perspective in many landscape shots—and some portraits if composed appropriately (**Figure 2.24**)—but they just might wreak havoc for a commercial portrait session.

ISO 100 • 1/30 sec. • f/2.8 • 32mm

Figure 2.23 Even at 32mm, wide-angle-lens distortion stretches the female model's legs since they exist near the left and bottom edges of the frame, areas where the curvature of the lens is extreme.

ISO 200 • 1/60 sec. • f/8 • 17mm

Figure 2.24 Although the composition is stylistically appropriate, in my opinion, the model's head is not proportionately correct as a result of a wide-angle lens pushed in tightly for the portrait.

Keystoning

Another issue wider focal lengths present is *keystoning*. Although technically not related to expansive perspective, it bears mentioning here since it is most evident when using lenses that achieve expansive perspective. Just as expansive perspective increases as you go wider with your focal length, so does this optical distortion. Keystoning refers to the convergence of vertical lines in a frame when a lens is pointed either up or down from being level with the horizon (**Figure 2.25**). A result of the shape of the lens elements, this converging of lines can express dominance or emphasize the importance of some subject matter in editorial contexts. However, it also severely distorts structures that we know to be level or square—not ideal for architects and others who value realistic depictions.

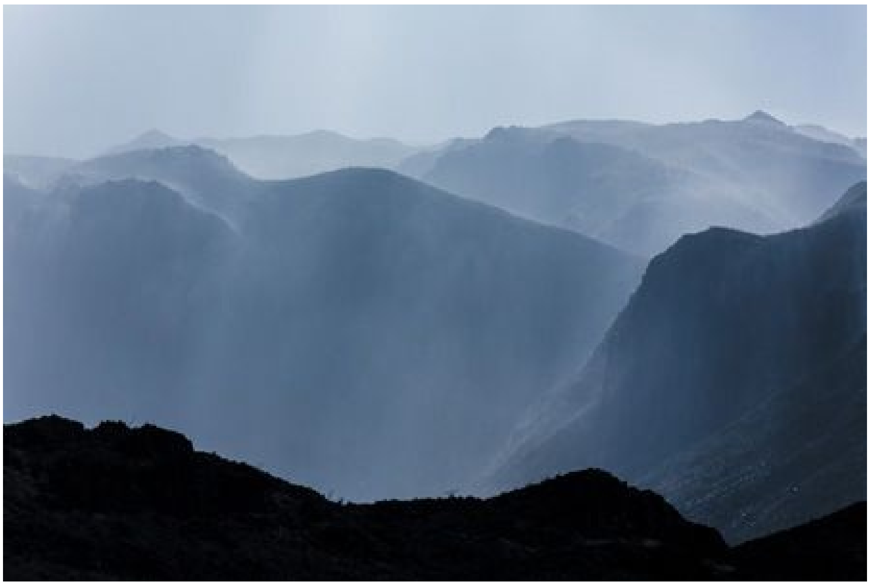
ISO 100 • 1/250 sec. • f/8 • 24mm

Figure 2.25 Normally, flagpoles don't lean and walls are built vertically straight. Keystoning forces vertical lines like these to lean in toward the middle of the frame when a wide-angle lens is pointed up (they lean the opposite way when the lens is pointed down).

Tolerance of keystoning varies in different fields, and it is good to be aware of when keystoning happens. The nice thing about both keystoning and any other form of optical distortion or exaggeration is that you can see it through the viewfinder. If you are new to working with wider-angle lenses, test it out by zooming out to the widest focal length, focusing on a building, and moving your lens vertically up and down. Watch all of the lines in the frame that tend to be vertical start to lean in or out depending on the direction in which you are moving the camera. It is an interesting effect, but it bears repeating that keystoning doesn't go over well in some realms of image making. Note that keystoning occurs with all lenses; it is just more exaggerated with wider-angle lenses. Past 200mm, you might be hard-pressed to even notice it.

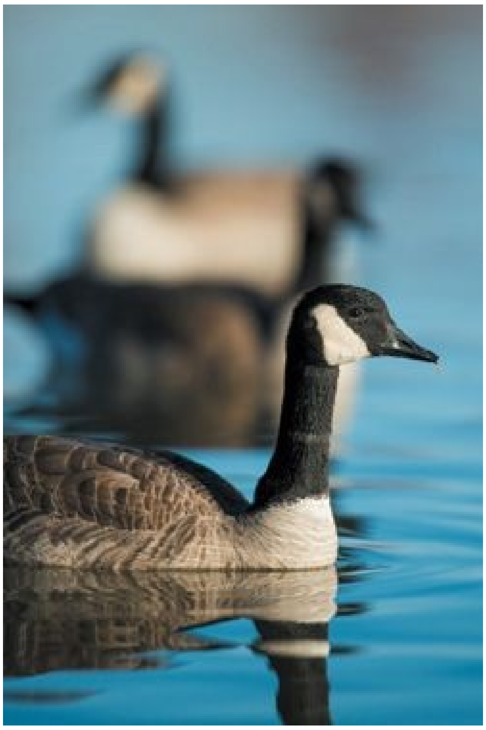
Compressed Perspective

On the other end of the focal-length spectrum, a completely opposite look and feel emerges. Instead of expanding the distance between foreground and background, compressed perspective, wait for it, *compresses* that distance (**Figure 2.26**). Longer focal lengths—typically 105mm and beyond—smash foreground, midground, and background together, and the longer the lens, the more compression you get as a result (**Figure 2.27**). Portrait photographers like using a longer lens combined with a large aperture to place an out-of-focus, abstract background right behind the subject (**Figure 2.28**).



ISO 200 • 1/1600 sec. • f/8 • 400mm

Figure 2.26 In order to emphasize the amount of rain, I used a long 400mm focal length to compress all of the mountains together.



ISO 100 • 1/2000 sec. • f/2.8 • 400mm

Figure 2.27 Even though the other two geese are quite some distance behind the one in focus, a long lens will draw them together as a result of optical compression.

ISO 100 • 1/100 sec. • f/4 • 105mm

Figure 2.28 Compression perspective is useful for creating beautiful, abstract backgrounds for portraits.

Landscape photographers use compressed perspective to draw out layers and patterns in vistas. Pulling backgrounds toward subject matter can be quite interpretive, and it is a great way to de-clutter an overly complex image. I enjoy using compressed perspective to create a sense of largeness in my landscape and outdoor work (**Figure 2.29**), and to highlight textural or pattern-like occurrences in environments that would otherwise go unnoticed without a longer lens's look (**Figure 2.30**).

ISO 100 • 1/320 sec. • f/2.8 • 145mm

Figure 2.29 With the wooded background pulled closer to the subject, the setting seems larger than the small creek on which the angler is paddling.

ISO 100 • 1/250 sec. • f/5.6 • 300mm

Figure 2.30 Compression also allows for a nice way to isolate pattern and texture in small areas of a photo-worthy context, such as this rock-strewn Llano River bank.

Compressed perspective is certainly another form of optical distortion, but it is treated less as such compared to expansive perspective. Although it does manipulate size—especially the relative size of the background compared to the foreground—it does not necessarily share the negative connotation. One thing to keep in mind is that compressed perspective threatens to make an already flat medium look even more flat. When working with longer lenses, pay close attention to photographic attributes such as color and light (and shadow) to increase or maintain the image's depth and dimension.

Normal Perspective

For a moment, lift your eyes from the book and look around you. Try to avoid using your peripheral vision and simply take in what is in front of you. Notice the size of the book compared to something of a similar size 5 feet away, then 10 feet away. Gauge the distance from where you are sitting or standing to a wall or tree or another static object. In completing this simple visual exercise, you have experienced (as you have your entire life) normal perspective. This so-aptly named perspective highlights a lens's ability to replicate the way our eyes actually see everything in our environment.

So, what is the focal length that most closely matches the way our eyes take in relative size and spatial relationships? On a full-frame camera, the tried and true 50mm is considered a *normal* lens. On an APS-C crop-sensor camera, a 35mm (more like 33mm) lens would do the job. The normal perspective is extremely popular. Standard zoom lenses, such as the AF-S Nikkor 24–70mm f/2.8G ED and AF-S DX Nikkor 18–55mm f/3.5–5.6G VR II, are designed around the normal perspective. At the university, the only lens I require students in introductory courses to have is a zoom lens with a focal length that exhibits normal perspective.

Many photographers enjoy shooting with normal perspective because of their ability to capture what they actually see—or at least get pretty close (**Figure 2.31**). I know photographers who for extended periods of time would only shoot with a normal-perspective lens. It is the perspective in which many of the world's most famous, historical shots were recorded. Although a prime AF-S Nikkor 50mm f/1.4G might not offer as much versatility as the Swiss Army knife of a lens, the AF-S Nikkor 28–300mm f/3.5–5.6G ED VR, it is still valued for its straight-ahead approach to making realistic images—not to mention its ultra-fast maximum aperture (**Figure 2.32**).

ISO 50 • 1/40 sec. • f/2 • 50mm

Figure 2.31 When on assignment photographing folks such as this ice sculptor, I like to make some images tight on the subject at 50mm to counter the expansive and sometimes distorted look of a wide-angle lens.

ISO 200 • 1/200 sec. • f/2 • 50mm

Figure 2.32 Because it captures subjects proportionately, a normal lens is great for environmental portraits.

It is worth mentioning that in highlighting expansive, normal, and compressed perspective, I left out some ranges of focal lengths. As mentioned previously, perspective changes on a sliding scale from extremely expansive to extremely compressed as focal lengths change. The valuable thing to keep in mind is that as one moves to wider focal lengths, one will achieve more expansive perspective, and the longer the focal length, the more compressed. Going into a shoot knowing this helps you to both see and compose great shots and avoid being surprised later by unexpected perspective-influenced issues in your images. You will see in the following four chapters how perspective plays a large role in considering different types of lenses for making the most of different subject matter and their environment.

Chapter 2 Assignments

Depth of field is so important to photographers! If there is one control that is a go-to technical and aesthetic consideration for folks new to photography, this is it. Below are a few assignments that will help you become more cognizant and confident in seeing and adjusting the depth of field your lens offers you.

It's all about the aperture

Thanks to relatively modern technology, there are multiple aperture values from which to choose, allowing you to make the finest adjustment to the amount of depth of field in the frame. Place your camera on a tripod and photograph a single subject (it could be a person or something inanimate, like a stuffed animal) positioned 5 feet from you. Start with your aperture wide open (the lowest value), and for each shot, stop your aperture down (up in value) by one stop until you cannot stop it down anymore. I recommend doing this in Aperture Priority (A) mode, but if you are in Manual (M) exposure mode, be sure to make equivalent adjustments to your shutter speed.

As you make these shots, check your LCD and notice how much depth of field you gain as you stop the aperture down each time. For more nuanced adjustments, stop your aperture down by a third of a stop each shot. Use this as a way to become more familiar with how the aperture's effect on depth of field will appear in your images. There are several variables that play into the appearance of depth of field, but this is the most fundamental of them all.

Move!

With the same subject, leave your lens at one focal length (50mm, for example) and the aperture at a fixed value (let's say f/5.6, but any will do). For this series of images, move closer by one foot every time you make an image, always maintaining focus on your subject. Move in closer until you pass your minimum focusing distance (the closest point you can focus on with that particular lens).

Now, start backing up a foot for each shot. Assess the level of perceived depth of field based on simply moving back and forth from your subject. You'll notice that the closer you move toward your subject, the shallower your depth of field becomes, and vice versa when you back out. This exercise will give you an idea of how to handle situations in which you've maxed out your aperture setting but may need more or less depth of field (especially handy when shooting portraits).

Go hyperfocal

Practice hyperfocal distance focusing by positioning yourself and your camera in front of a subject-heavy scene. It could be a landscape or cityscape with a strong foreground subject and a noticeable background subject. Place your camera on a tripod, compose your shot, and make your best guess at how far one-third of the distance between your background subject and the camera is. Focus on that point.

Stop your aperture down all the way, and make a few exposures. Check your focus. Is everything from the foreground subject to the background sharp? If it isn't, you might have to adjust where you placed the focal plane. If that doesn't work, you are more than likely too close to the foreground subject (remember minimal focusing distance). If it helps to do so before tackling a land or cityscape, set up four cones on a 100-foot stretch of pavement, two to indicate foreground and background, the other two to mark the points that split the distance into thirds. Focus on the second cone from the camera, and check your focus. Hyperfocal distance can be hard to judge when shooting in the field. Like anything, the more you work with it, the better you get at doing it.

Share your results with the book's Flickr group!
Join the group here: www.flickr.com/groups/nikonlenses_fromsnapshotstogreatshots

3. Ultra-Wides and Wides

ISO 200 • 1/50 sec. • f/22 • 17mm

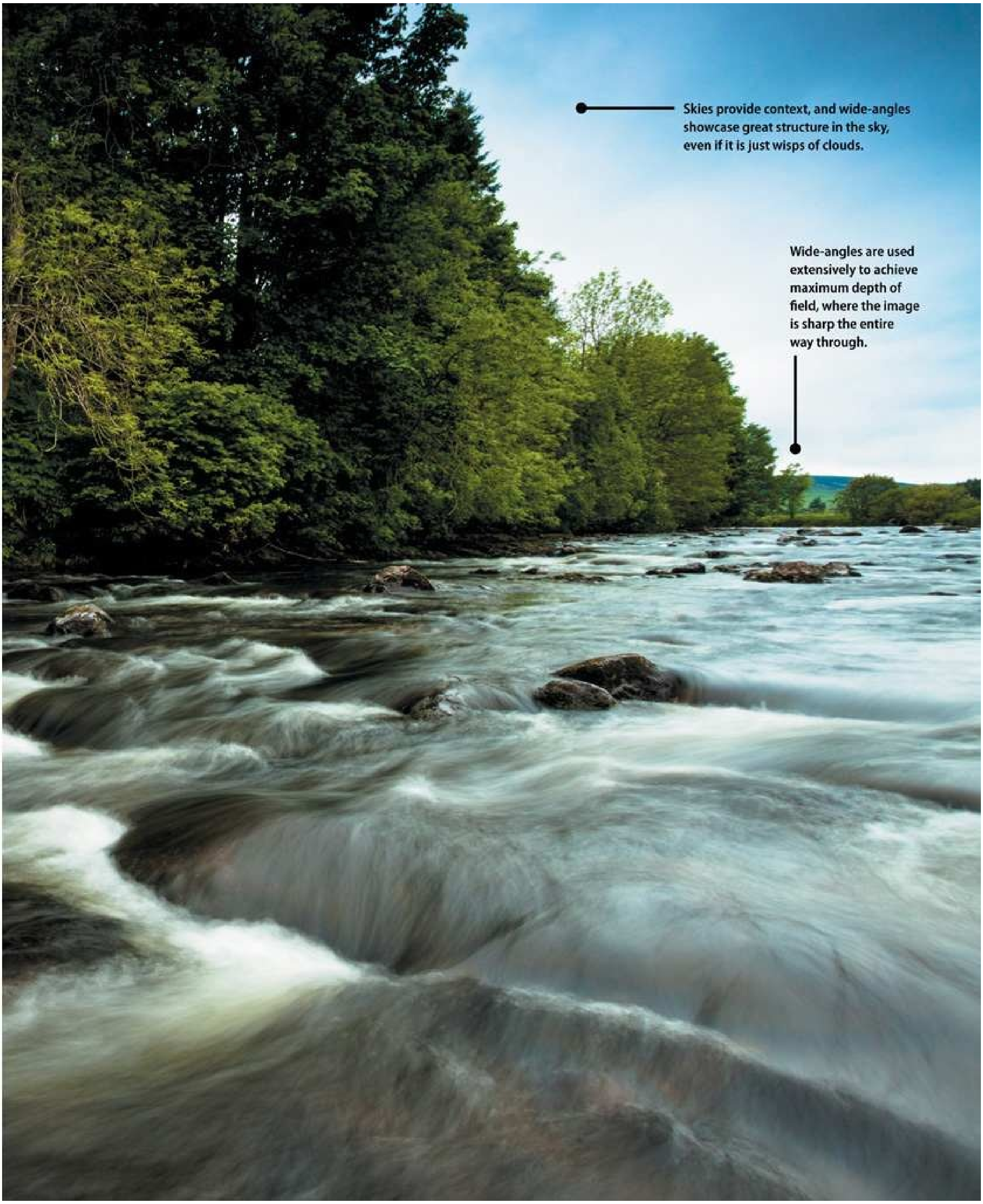
Expansive opportunities

I have to be honest: I love wide-angle lenses. I love the extremely wide perspective, the bulbous glass at the end of the lenses, that they are not the size of telephotos, and that I can handhold wide-angle lenses using relatively slower shutter speeds. I am constantly drawn to images that showcase great use of wide-angle focal lengths, and I'm apt to *see* images in terms of wider focal lengths before considering longer lenses. Ultra-wide and wide-angle lenses have value in the photographer's camera bag, offering us really cool perspectives. I don't know anyone who has not had an "oh, wow!" moment after looking through a 14mm or 10mm focal length for the first time. Afterward, it's all about converting that moment to outstanding images!

Poring Over the Picture

ISO 100 • .6 sec. • f/22 • 17mm


Wide-angles are able to showcase many storytelling elements in one still frame.
Expansive perspective exaggerates the size of the foreground, highlighting the important facets of the image.



How Wide Can You Go?

Really wide! As a matter of fact, 10mm is the widest focal length Nikon lenses can reach. This is the widest end of the widest Nikon zoom lens, the AF-S DX Nikkor 10–24mm f/3.5–4.5G ED (**Figure 3.1**). Wide-angle focal lengths typically comprise focal lengths of 24mm to around 35mm (these are full-frame focal lengths), and those wider are designated as “ultra-wide.”

ISO 200 • 1/100 sec. • f/11 • 10mm

Figure 3.1 Nikon's widest focal length is 10mm (which looks more like 15mm on a DX cropped-sensor camera body), allowing you to expand the view of interesting subject matter.

Fisheyes

Although *fisheye* lenses have been around for more than a century, they gained wide appeal about 50 years ago and are still considered a popular niche lens. Both Nikon fisheyes (the AF DX Fisheye-Nikkor 10.5mm f/2.8G ED and the AF Fisheye-Nikkor 16mm f/2.8D) exhibit the visual qualities of their monikers, offering a 180-degree angle of view. What does this mean? It means if you point the lens straight at the horizon, you'll more than likely capture your shoes in the shot, as well as the sky straight above you (**Figure 3.2**). As a result, everything within the frame of a fisheye lens is distorted, seemingly stretching outward toward the image's viewer. When you see a fisheye perspective, you immediately know it for the extreme distortion and curvature of straight lines, such as the horizon, building corners, and the like (**Figure 3.3**).

ISO 100 • 5 sec. • f/9 • 16mm

Figure 3.2 The AF Fisheye-Nikkor 16mm f/2.8D captures a 180-degree angle of view, forcing one to be aware of where his or her tripod legs rest. (Photo by Alan Hess)

ISO 100 • 8 sec. • f/13 • 16mm

Figure 3.3 Moving the tripod leg out of the frame makes for a readily identifiable fisheye perspective. (Photo by Alan Hess)

As I stated earlier, fisheye lenses fulfill a niche function. The extreme curvilinear distortion and warping of the image is a unique visual, and although these lenses are downright fun to play with, they are not for everyone. I don't own one—they just don't fit my style. Others have a ball with them, seeing everything from landscapes to cityscapes in new, bulbous ways!

Rectilinear Lenses

For those who want to avoid the fisheye look, the AF Nikkor 14mm f/2.8D ED offers an extremely wide perspective without the distortion that reveals the curvature of the lens elements. The 14mm is a *rectilinear* lens, which means it maintains straight lines as visually straight, despite the accompanying wide-angle distortion that occurs when focal lengths get more and more expansive (**Figure 3.4**). This feature paired with this focal length makes for an incredible landscape lens (**Figure 3.5**), as well as one that can be used to really push up on high-action activities and show off the environment at the same time (**Figure 3.6**).

ISO 200 • 1/200 sec. • f/11 • 14mm

Figure 3.4 **Even though it is extremely wide, the rectilinear AF Nikkor 14mm f/2.8D ED still keeps linear subject matter straight, such as the fence post and the barbed wire.**

ISO 100 • 1/40 sec. • f/16 • 14mm

Figure 3.5 Extremely wide-angle lenses typically have short minimal focusing distances, allowing the shooter to compose tightly on significant subject matter.

ISO 200 • 1/1000 sec. • f/5.6 • 14mm

Figure 3.6 Want to make your viewers feel like they are part of the action? Take a wide-angle like the AF Nikkor 14mm f/2.8D ED or the AF-S DX Nikkor 10–24mm f/3.5–4.5G ED into the thick of it.

Although it is difficult to use in all instances, given that subject matter diminishes in size greatly if just a few feet away, the AF Nikkor 14mm f/2.8D ED is an extremely well made and highly functional lens for those wanting the widest rectilinear focal length possible in the smallest package. Others may prefer the more versatile and extremely high-quality (but much larger) AF-S Nikkor 14–24mm f/2.8G ED. In either case, if you're anything like me, you'll find an affinity for this focal length.

Keep an Eye on the Glass

One thing to keep in mind with all lenses, but especially the widest of the wide, is the importance of taking care of the outer lens element. I'll touch on lens care in Chapter 8, but since we're on the subject of lenses that feature bulbous front elements, it is worth saying here: It is just too easy to put a greasy thumb- or fingerprint on that glass, or bump it into a hard corner. Consider always placing the lens cap on the lens when it is not in use, carry a lens cloth (always) with you, and, as my buddy Alan Hess taught me a few years ago, sling your camera over your shoulder with the lens pointing toward you instead of away from you. This way, the lens element is less likely to come into contact with grubby hands, brick walls, and the like.

Ultra-Wides for Every Day

Wide-angle lenses for Nikon typically range in focal length from 10mm to 35mm. Technically, anything wider (or shorter) than 50mm can be considered wide-angle, but the closer the lens is to normal perspective, the more it loses that visual essence. For me and many others, the perfect wide-angle lens—which is part of the trinity written about earlier in the book—is a lens that covers the ultra-wide and wide alike. Wide-angle zoom lenses, such as the AF-S Nikkor 14-24mm f/2.8G ED, the AF-S Nikkor 16–35mm f/4G ED VR, and the AF-S DX Nikkor 10–24mm f/3.5–4.5G ED (for crop-sensor cameras), provide such an offering. They move from extremely wide-angle perspectives perfect for landscapes (**Figure 3.7**) to a longer focal length loved by many photojournalists and street photographers (**Figure 3.8**).

ISO 100 • 1/40 sec. • f/16 • 24mm

Figure 3.7 My first thought when I see a river like the Rio Grande in the Texas Big Bend is to go wide!

ISO 400 • 1/100 sec. • f/2.8 • 30mm

Figure 3.8 On the longer end of wide-angle focal lengths, 30mm was perfect for showcasing the artist, his work, and his studio without sacrificing the context to distortion.

A lens that covers landmark focal lengths, such as 16mm, 24mm, and 35mm, is ideal for an all-around wide-angle zoom. I prefer a wide-angle zoom that covers this range. Like many shooters, I tend to move from one extreme of the lens to the other and not hit much in between. I might use 16mm to tighten up on a feature-heavy portion of a desert landscape, and then move somewhere close to 35mm to make an environmental portrait. Somewhere near the middle is 24mm, a popular focal length for wide-angle prime lenses, as well as the starting point for the higher-end standard zoom lenses (**Figure 3.9**). It is also a very flexible focal length that doesn't quite distort like 16mm but can still be used effectively to establish a visual context in the shot (**Figure 3.10**).

ISO 100 • 1/2000 sec. • f/2.8 • 24mm

Figure 3.9 I used a 24mm focal length to move in tight on research activities of several marine biologists while also keeping the team’s diver relevant to the story.

ISO 100 • 1/1600 sec. • f/5.6 • 24mm

Figure 3.10 Since 24mm does not distort as much as wider focal lengths, I tend to see environmental portraits at their widest starting at this focal length.

If I Had to Choose: AF-S Nikkor 14–24mm f/2.8G ED

It is easy to fall in love with wide-angle lenses, and I'm a sucker for a good wide-angle zoom. Enter the AF-S Nikkor 14–24mm f/2.8G ED. Before Nikon introduced this zoom lens, a typical ultra-wide-angle zoom reached as wide as 16mm. It may not sound like much, but going to 14mm on the wide end of the zoom range made a great deal of difference. Take that extra 2mm of focal length and combine it with quality, hardy construction, and beautiful glass, and it is little wonder why many refer to this lens as the *ultimate* wide-angle zoom.

Nikon makes a great AF-S Nikkor 16–35mm f/4G ED VR, and even though it is about US$600 cheaper than the 14–24mm, it sacrifices an entire stop of light when the aperture is wide open. This might not mean much to landscape shooters, but to editorial and journalistic photographers, it is a big deal. If you are anything like me and use wide focal lengths quite a bit (Figure 3.11), it's worth investing in a quality zoom lens that lets you go wider than the typical lenses while also remaining rectilinear.

ISO 50 • 5 sec. • f/22 • 17mm

Figure 3.11 I often shoot near the extremes of lenses, hence my tendency to shoot very wide perspectives. Rugged, structure-heavy Scottish streams invite this perspective.

However, the AF-S Nikkor 14–24mm f/2.8G ED is not without its issues, the US$2,000 price tag being one of them. The lens also has a fun-to-look-at but awfully bulbous front lens element. This large element is necessary for the focal length zoom range, but it is prone to hitting hard-edged corners. The built-in, permanent lens hood helps, but it doesn't protect the very front of the glass. In addition, using filters with this lens is not straightforward. It is possible to use a drop-in filter-holder system like the LEE SW150 (a pricey solution at US$400), but this lens does not take screw-on filters. All that being said, the AF-S Nikkor 14–24mm f/2.8G ED is still an extremely nice piece of glass and worth the investment.

Composing With Wide-Angles

Most folks new to ultra-wide-angle photography point the camera up and watch the sky (or high rises, depending on where they live) stretch on forever. Wide-angle lenses can be extremely fun to play with, but taking that play to the next level means being attentive to composition and noticing how everything that is arranged in the shot is affected by the focal lengths used. This is where wide-angle images go from being neat pictures to being compelling and engaging photographs.

Work the Sky

Where I live in West Texas, the sky is one of our strongest visual assets. This region is extremely flat, and the sky is the biggest thing around. It is also a playground for photographers, offering up some of the best color, clouds, and storms to shoot in the world. As a result, local photographers are very conscientious and almost snobbish about the skies we use as both the main subject and background for our images. And it is all about the structure.

Simply put, skies with unique cloud structures are more interesting than if they were empty. The sky is not something we can control, and bald (cloudless) skies are simply a part of shooting outside. However, we can take advantage of the shapes and forms the sky presents some days (**Figure 3.12**).

ISO 50 • 1 sec. • f/22 • 17mm

Figure 3.12 **I'm a sucker for great thunderstorms, and I favor shooting them with extremely wide focal lengths for the expanse that often parallels a ferocious one.**

Outstanding sunsets and layered color at sunrise or sunset, striated clouds cutting diagonally across the sky, and intense overhead thunderstorms are good reasons to compose a wide-angle shot with little more than the sky itself. When presented with these types of skies, move to a position so the structure fills the frame (**Figure 3.13**). Sometimes this means moving closer to the storm (while being safe) or farther under the clouds.

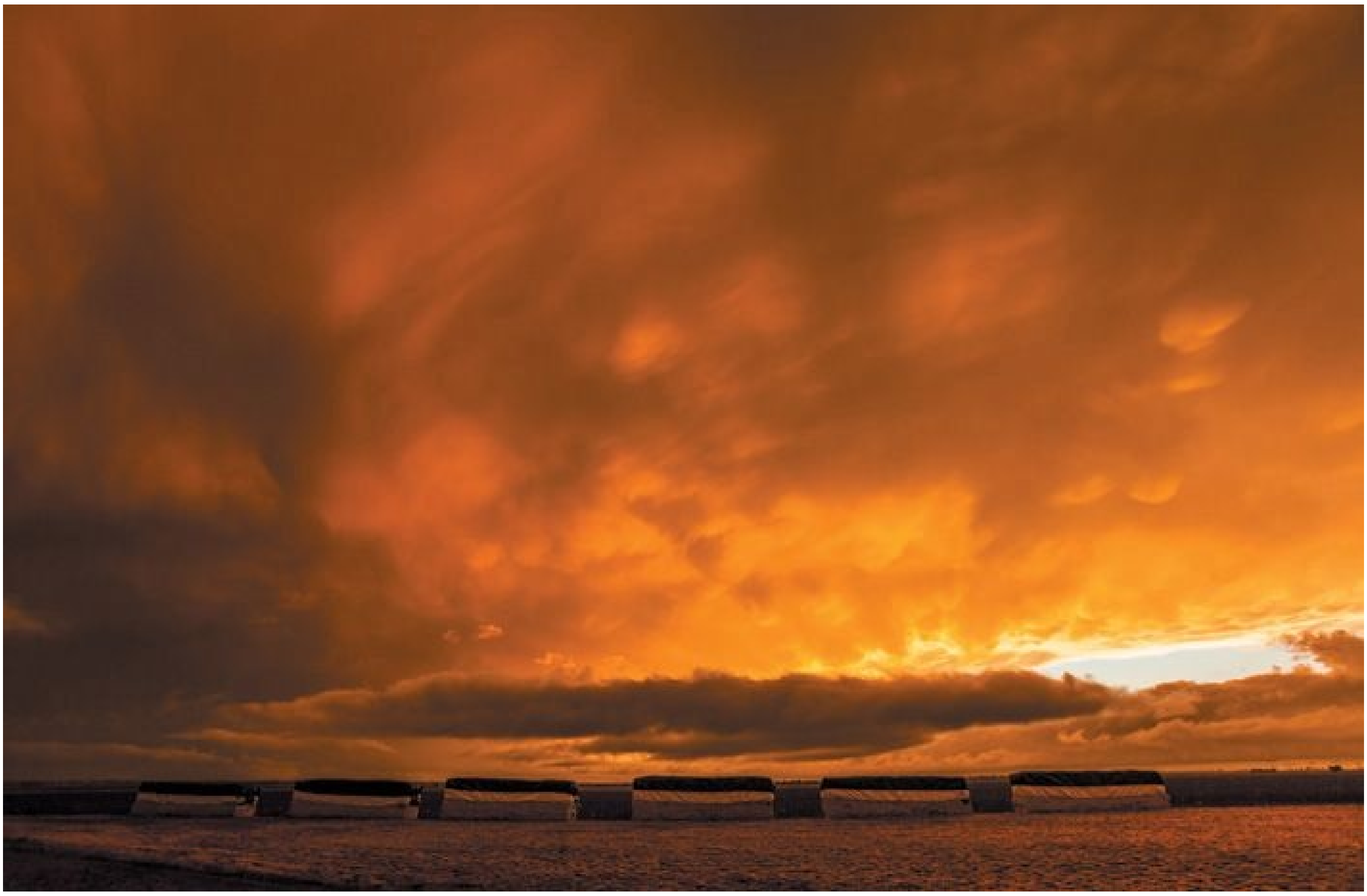
ISO 100 • 1/6 sec. • f/5.6 • 24mm

Figure 3.13 With a wide-angle, one can move into a unique and sometimes extreme cloud structure to produce the feeling of being under it.

Even though the sky is the champion in shots like this, remember to place at least a sliver of the earth's horizon in the shot (**Figure 3.14**). Showing a bit of land does two things: It provides both perspective and scale, and it showcases context and a sense of place. A very colorful sky full of performance can seem massive when tied to a minute structure on the ground, and that structure on the ground gives the viewer an idea of the environment in which it was shot (**Figure 3.15**). Power lines (which I desperately try to avoid at a small visual scale) and city buildings suggest an urban backdrop; mountaintops silhouetted against the sky indicate something more natural.

ISO 100 • 1/30 sec. • f/5.6 • 24mm

Figure 3.14 Placing a sliver of the flat West Texas horizon at the bottom of the frame gives a sense of scale to this impressive, colorful sky.



ISO 200 • 1/100 sec. • f/5.6 • 17mm

Figure 3.15 Just the tiniest bit of structure composed well in a shot can give storytelling clues, like these large cotton modules waiting out a massive thunderstorm.

Working the structure in a sky and filling a wide-angle frame up with great clouds and color help a shooter avoid capturing a lot of unwanted and unnecessary void space. For the most part, you want to avoid shooting an empty sky (**Figure 3.16**). Sometimes the void is what you want, perhaps for unique color or interpretive value (**Figure 3.17**). The void can be very powerful as a way to show emptiness and critical depth. When I am confronted with bald skies or clouds lacking character, I look for other natural or artificial structures, such as the overhanging branches of a large tree or a creative feature of a building downtown (**Figure 3.18**).

ISO 100 • 1/125 sec. • f/5.6 • 34mm

Figure 3.16 **I wanted the full moon to work for this shot of Sawtooth Mountain, but it was simply too small and too far above the mountain, poised in an otherwise uninteresting, featureless sky.**

ISO 100 • 1/250 sec. • f/5.6 • 17mm

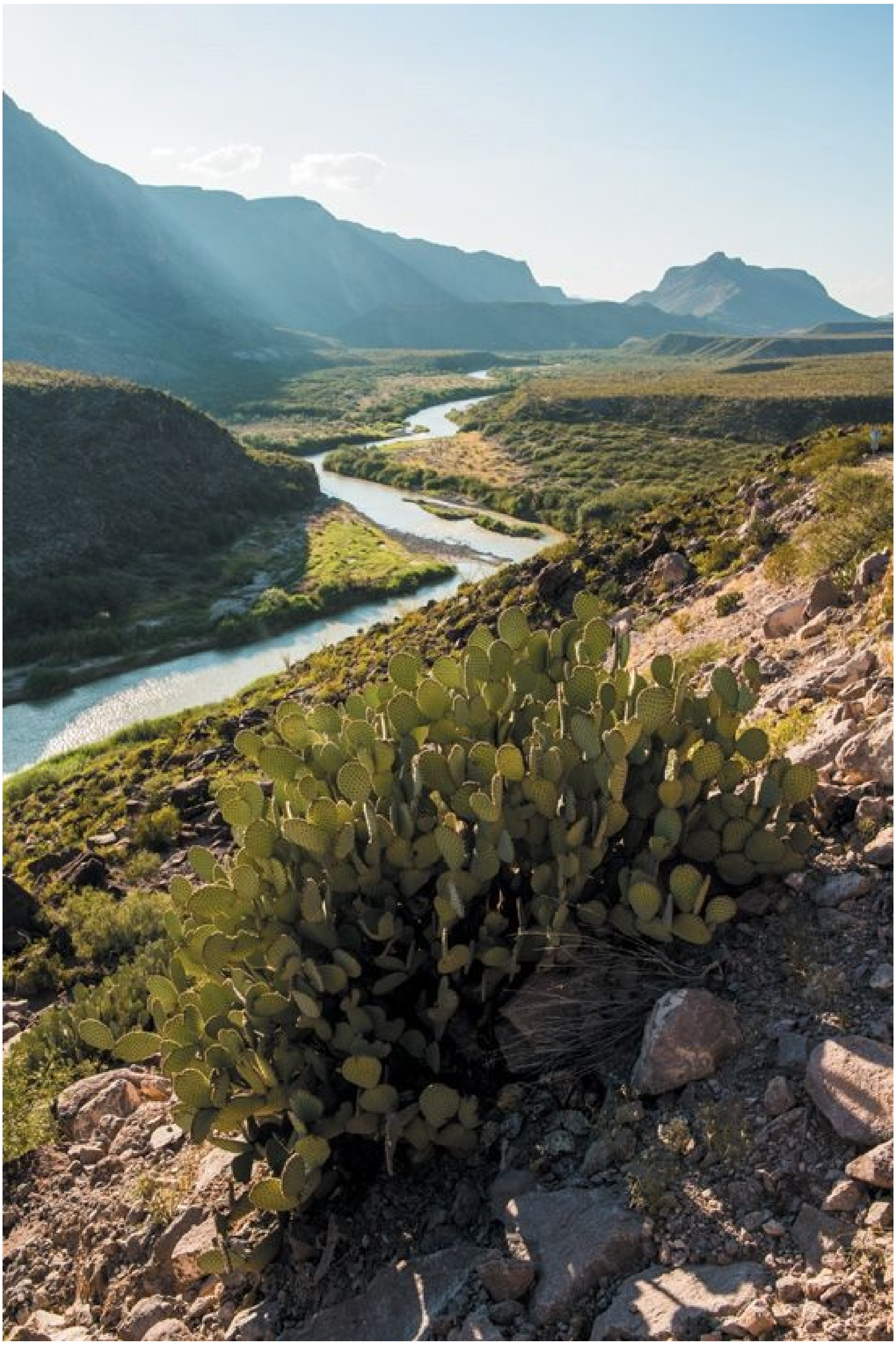
Figure 3.17 The large, open sky, combined with a unique color gradation and the silhouette of the primary subject, conveys feelings of nostalgia, youth, or just smallness.

ISO 100 • 1/160 sec. • f/8 • 17mm

Figure 3.18 For skies lacking strong structure, lines, or leading composition, I will add artificial components like this irrigation system to increase interest and a sense of place to the shot.

Push In on the Foreground

One of my favorite things to do with a wide-angle lens is find something of importance to the environment in which I'm shooting and make *it* the foreground (**Figure 3.19**). The nice thing about wide-angle lenses is that the minimum focusing distance is fairly short, allowing you to maintain focus on the subject while being just inches from it (**Figure 3.20**). Another asset of wide-angle lenses—their expansive perspective—keeps you from losing the environment. Concentrate the lens on a visually appealing part of a story but keep the story world as part of the picture (**Figure 3.21**).



ISO 100 • 1/40 sec. • f/16 • 32mm

Figure 3.19 A large prickly pear serves as a strong foreground subject against an expansive river valley.

ISO 200 • 1/500 sec. • f/2.8 • 24mm

Figure 3.20 **Being able to focus inches away from the small purple flowers at a wide focal length offered me a way to also expose the riparian habitat that gives life to the vegetation.**

ISO 50 • 1 sec. • f/22 • 14mm

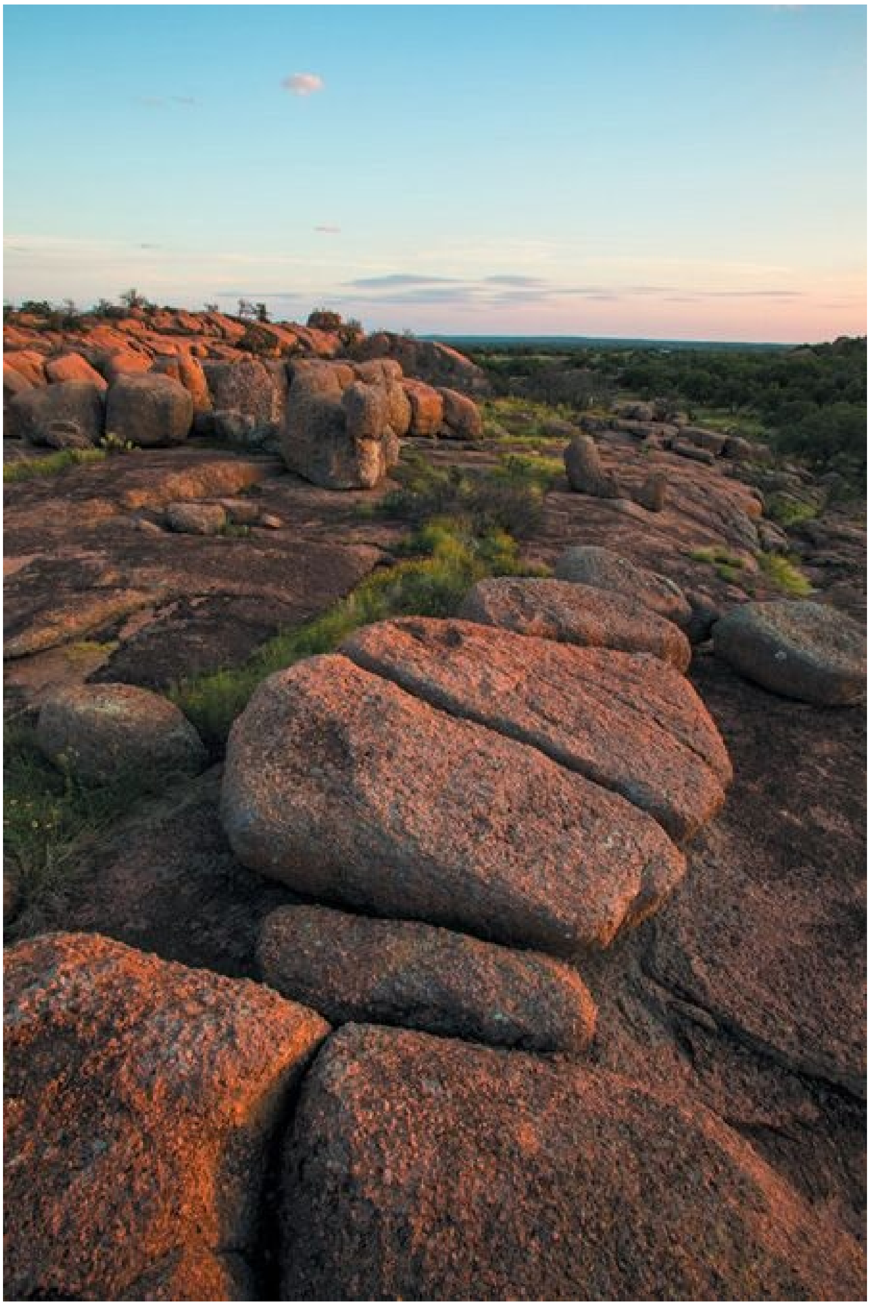
Figure 3.21 The curved feature of this small waterfall on a desert creek is an accent worth pushing in on tightly.

The rule of thirds—one of the Holy Grail composition guides, suggesting placement of significant subject matter on invisible lines that trisect the frame into vertical and horizontal thirds—comes in especially handy while using strong foregrounds and wide focal lengths. Keeping the primary subject matter near the left or right vertical third and on or in the bottom third of the shot leaves plenty of real estate for the mid-ground expanse, as well as the horizon line on or in the upper third of the frame (**Figure 3.22**). Design-wise, this type of composition also leaves room for placement of text or other graphics that complement the editorial use of an image.

ISO 100 • 1/125 sec. • f/14 • 24mm

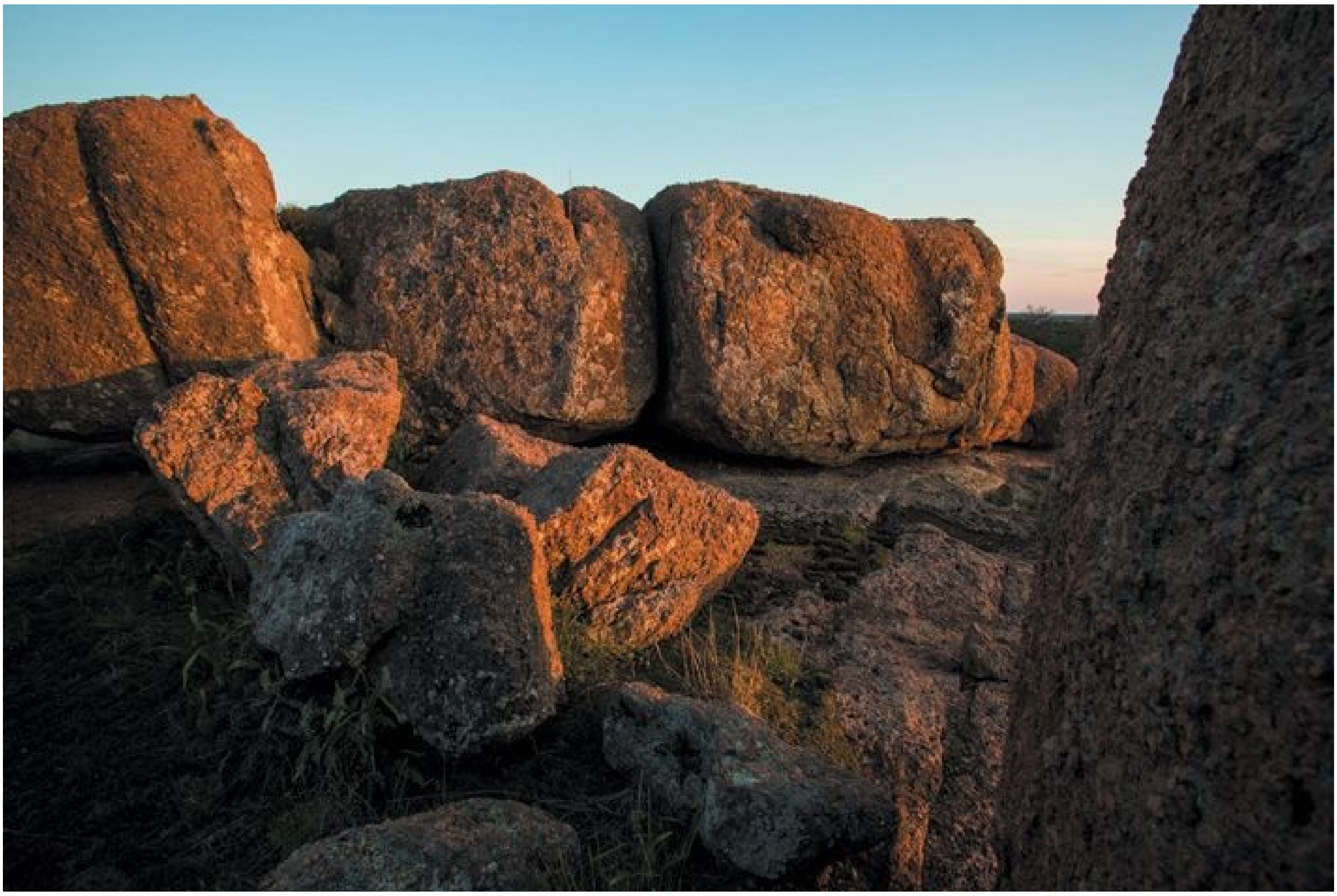
Figure 3.22 A wide-angle pushed close to the primary subject was essential in this shot covering new water conservation technologies that farmers are using.

Strong foreground subjects can also be used as guiding lines themselves. Explore the linear structure of subjects, considering it as a way to direct the eye through the frame. Wide-angle focal lengths allow us to exaggerate this direction, resulting in both aesthetic and strategic composition. One of my favorite places to discover new lines in unsuspecting subject matter is a large pink granite mountain in the Texas Hill Country (**Figure 3.23**). From high and low, I can find great wide-angle composition by simply pushing in tighter on nearby boulders and arranging myself so that other boulders fall in dynamic lines through much of the frame. I also use fragments of subject matter to help frame a shot (**Figure 3.24**).



ISO 200 • 1/15 sec. • f/11 • 17mm

Figure 3.23 Looking through an extremely wide-angle lens and varying your position may uncover strong lines in subject matter you would normally not consider because of its form, such as these short granite boulders.



ISO 200 • 1/25 sec. • f/11 • 17mm

Figure 3.24 Wide-angle focal lengths such as 17mm make using a piece of an extremely close foreground subject (like the boulder at the right) useful for framing other subject matter while the foreground remains in focus.

Break the Rules

Speaking of the rule of thirds, there are times when it should be ignored. This is the “rules are meant to be broken” part of the book.

Center the subject

When a subject is so valuable that you want to direct immediate attention to it, placing the subject in the middle of the frame will do it for you (**Figure 3.25**). Of course, haphazardly doing so might cause confusion, especially if the subject is very small compared to its surroundings. Instead, push in tight on the primary content. The curvature of wide-angle lenses—rectilinear or curvilinear—will force the subject to pop out toward the viewer (**Figure 3.26**). As the subject enlarges, you are being very deliberate about where your viewers’ eyes go. Since wide-angles still let you keep the environment in the picture, consider using strong lines on either side of the subject to frame it and form an invisible vanishing point beyond it.

ISO 400 • 1/80 sec. • f/3.2 • 17mm

Figure 3.25 **When centering subject matter in the shot, such as James Watkins's pot, consider filling the entire frame with the general form of the subject. The large circle of the potter's wheel is the foreground.**

ISO 400 • 1/60 sec. • f/3.2 • 31mm

Figure 3.26 Placing Watkins's hands—a vital part of his artistic process—in the middle of the frame seems appropriate composition for this frame only because I shot tight on them and made them leap from the background with expansive perspective.

Warped perspective

Breaking compositional rules with a wide-angle lens, particularly the extremely wide ones, such as the fisheyes and the shorter extremes of the zoom lenses, is often kept in check by the focal lengths. While expansive perspective exaggerates the distance between foreground and background—something we are mostly in favor of when using these lenses—we also experience severe distortion (**Figure 3.27**).

ISO 250 • 1/30 sec. • f/5.6 • 17mm

Figure 3.27 As windblown as West Texas is, the leaning of the electricity poles is a result of keystoning, a type of optical distortion common with wide-angle lenses.

Pointing a wide-angle lens up and down, and pushing it in on a subject and then backing it out all come with fairly drastic changes in perspective. It is the nature of the focal lengths to alter everything in the lens with the exception of the smallest part of the center of the frame (**Figures 3.28** and **3.29**). This area is like the eye of a hurricane, in which all is “normal.” Outside this very small zone, lines are extended, subject matter grows or shrinks (depending on its distance from the lens), and contents near the edges of the frame begin to stretch so much it looks like they’re trying to get out of the shot.

ISO 100 • 1/200 sec. • f/11 • 14mm

Figure 3.28 **Keystoning is exaggerated when subject matter with vertical lines, like the windmill, are closer to the edges of the frame, where the curvature of the wide lens is most severe.**

ISO 100 • 1/200 sec. • f/11 • 14mm

Figure 3.29 One way to mitigate distortion is by moving important subject matter closer to the center of the frame. The windmill is still keystoning but not as drastically.

Distorting perspective is the nature of these lenses and wider focal lengths. It is handy, though, to know where this distortion can get us in trouble. I'm all for breaking the rules when it counts, but when something round (like the petals on flower plants) becomes extremely oblong, I re-adjust my composition, my physical position, or even the lens I'm using to negate this unwelcome warping. I encourage shooting at wide focal lengths every chance you get just to see how subject matter reacts in the frame.

The Wide-Angle Portrait

If you are new to photography, you may have heard that it is inappropriate to shoot portraits with wide-angle lenses. If you are not so new to photography, you may be telling this to newbies. There is validity in adhering to and offering up this piece of advice, but it is far from a rule to follow strictly. Some of my favorite portraits were made at 24mm. There are ways to make great portraits with wide-angles (**Figure 3.30**).

ISO 200 • 1/30 sec. • f/8 • 17mm

Figure 3.30 A wide perspective provides this portrait with context to go along with the character at the pump.

It all depends on the type of portrait you are wanting to make. More formal portraits may not benefit from the expansive perspective that wide-angles exhibit (**Figures 3.31**, **3.32** and **3.33**). For example, corporate head shots require the least amount of distortion possible to a face and body. Wide-angles don't surface much in bridal and traditional engagement and family portraits. Aesthetically, these types of portraits benefit more from longer focal lengths that compress distance between foreground and background, and more easily throw the background out of focus.

ISO 100 • 1/100 sec. • f/5.6 • 24mm

Figure 3.31 Push a wide-angle close to someone's face and features start to become more round and protruding.

ISO 100 • 1/100 sec. • f/5.6 • 24mm

Figure 3.32 Photograph a face at the same distance from below and the chin starts to elongate, as does the nose.

ISO 100 • 1/100 sec. • f/5.6 • 190mm

Figure 3.33 Headshots are best made at longer focal lengths that approach telephoto in order to keep facial and body features proportionate.

However, wider lenses are great for environmental portraiture and less traditional forms of portraits. As an editorial photographer, I'm constantly in environmental portrait mode, where showcasing the primary subject's context is important (**Figure 3.34**). Wider focal lengths allow the shooter to include a great deal of this environment while also powerfully composing the subject (**Figure 3.35**).

ISO 200 • 1/60 sec. • f/2.8 • 17mm

Figure 3.34 **Wides are excellent lenses for environmental portraits, where showcasing the subject, like this western artist, in his space is important to telling a story.**

ISO 800 • 1/60 sec. • f/4 • 24mm

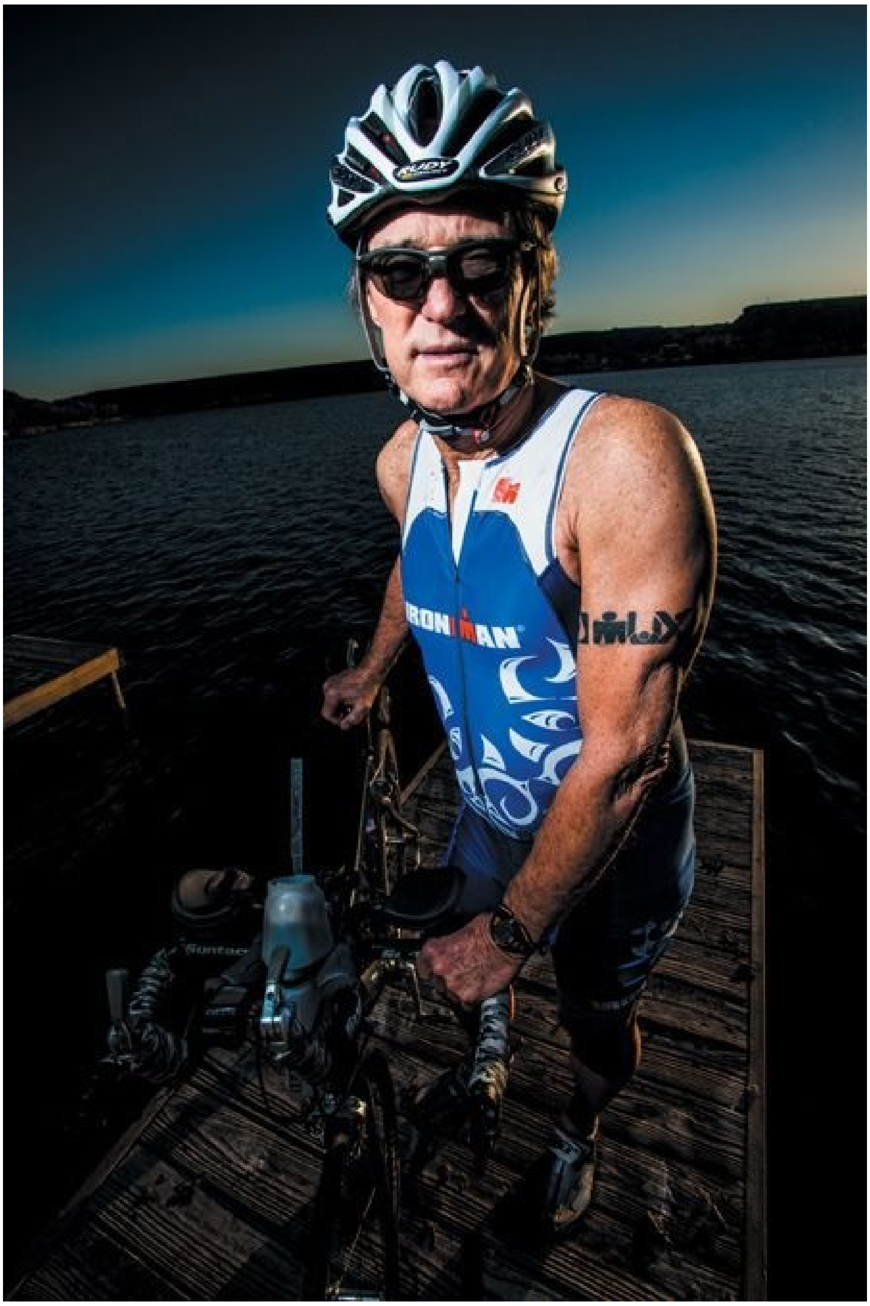
Figure 3.35 A boutique owner and her place of work. Wide-angle lenses are still good for pushing in to waist-high portraits, as long as the subject's body is not too close to the edge.

Full-body environmental portraits work well if the subject is kept from the edges of the frame, where her form may stretch too much because of the glass. Pushing in tight on a waist-up version of the same subject engages the viewer with the subject in a more stylized fashion. Family portraiture that resembles a photojournalistic look more than a traditional one can employ wide focal lengths to place the viewer in the "middle" of the action. Portraits that also exhibit interpretive drama and intensity are often wide-angle shots (**Figure 3.36**).

ISO 100 • 1/200 sec. • f/13 • 17mm

Figure 3.36 From below, wide-angles elongate the body, making the subject seem taller. For athletes, this perspective conveys power.

This look is not for everyone. Heavier people tend to gain more weight visually when wide-angles are pushed in on them, and while shooting subjects from below eye level may convey power for some, others may not like how it elongates their body. When shooting down on a subject with a wide-angle, you may turn the subject into a bobble-head doll (**Figure 3.37**) or make them top-heavy, seemingly leaning toward the outer edge of the frame along a slanted line (**Figure 3.38**).



ISO 100 • 1/200 sec. • f/16 • 17mm

Figure 3.37 **Mike’s no bobble-head doll, but shooting down on him at 17mm makes his head seem much larger than the rest of his body.**

ISO 100 • 1/200 sec. • f/11 • 17mm

Figure 3.38 A farmer looks like he is leaning toward the edge of the frame due to the lens distortion, as it is pointed more downward than upward. Looking closely will also reveal that the lit side of his face stretches just a bit toward the edge as well.

The wide-angle portrait is a balance act of context and perspective. Although lenses have no bias toward gender, people viewing portraits often do. Wide-angles are less prevalent in making portraits of women—especially in commercial settings—than of men, due to the level of distortion that comes with these lenses (**Figure 3.39**). Again, it all depends on the type of portraiture you are looking to create (**Figure 3.40**). Practice and knowledge of how the lens will affect the portrait's look are key to successfully using it (**Figure 3.41**).

ISO 100 • 1/160 sec. • f/13 • 17mm

Figure 3.39 **An interesting portrait of a building-planning committee, but I don't believe the woman in green appreciates the enlarged size of her hand. Since it is closer to the wide-angle lens, it falls victim to expansive perspective.**

ISO 500 • 1/125 sec. • f/4 • 24mm

Figure 3.40 Wide-angle lenses are great for portraits that are highly stylized or dramatic, where the distortion that occurs is insignificant, such as in this short-lit portrait of a literature student.

ISO 50 • 1/250 sec. • f/2.8 • 32mm

Figure 3.41 Knowing that a wide-angle lens would severely distort Michael Stutz's artwork, I decided to go with the longer end of the wide spectrum and use just a part of the art for this full-length portrait.

All this being said, extremely wide focal lengths are generally not used for portraiture. The next chapter will cover a vast range of lenses and focal lengths that are more popular for this type of work, as well as a great many other forms of photography.

Chapter 3 Assignments

When I got my first wide-angle lens, it didn’t come off my camera for six months. I worked with it tirelessly to get acquainted with it and learn how to compose different types of shots without getting too out of hand, perspectively speaking.

Lock it to the left

Walk outside with your wide-angle lens and zoom it out to the widest focal length (if you have a prime lens, just walk outside). Whether it is 24mm, 18mm, or 10mm, stay at one focal length and work on composing with an extremely expansive perspective. Look around for strong subject matter to place in the foreground of some landscape shots, such as a knee-high plant or small rock formation. If you are downtown, look for street signs to compose with iconic buildings or roads to showcase strong lines. Working with the widest focal length you can will allow you to get comfortable with it, and as a result, develop some very interesting images.

Study the structure of the sky

Point your camera up to the sky and look for great composition up there. The next time a thunderstorm rolls your way, or the sky looks like it will offer up a nice sunrise or sunset, position yourself under it and look for structure. Strong lines created by striations or stretches of clouds, identifiable forms like circles and triangles, and layers of color make for not only interesting skies but often intriguing shots.

Portraits with a purpose

Choose a person—friend or family member—and photograph her in her environment. Create several portraits of your subject at varying wide-angle focal lengths and camera-to-subject distances. Seek out compositional elements and prime spots in which to place your subject. When moving in and away from your subject, recomposing the person in the frame, pay special attention to the distortion the focal length creates for the environment and your subject. Shoot full-length shots as well as waist-up portraits, and see what works best with the environment and the subject.

Share your results with the book’s Flickr group!
Join the group here: www.flickr.com/groups/nikonlenses_fromsnapshotstogreatshots

4. Standard Zooms and Primes

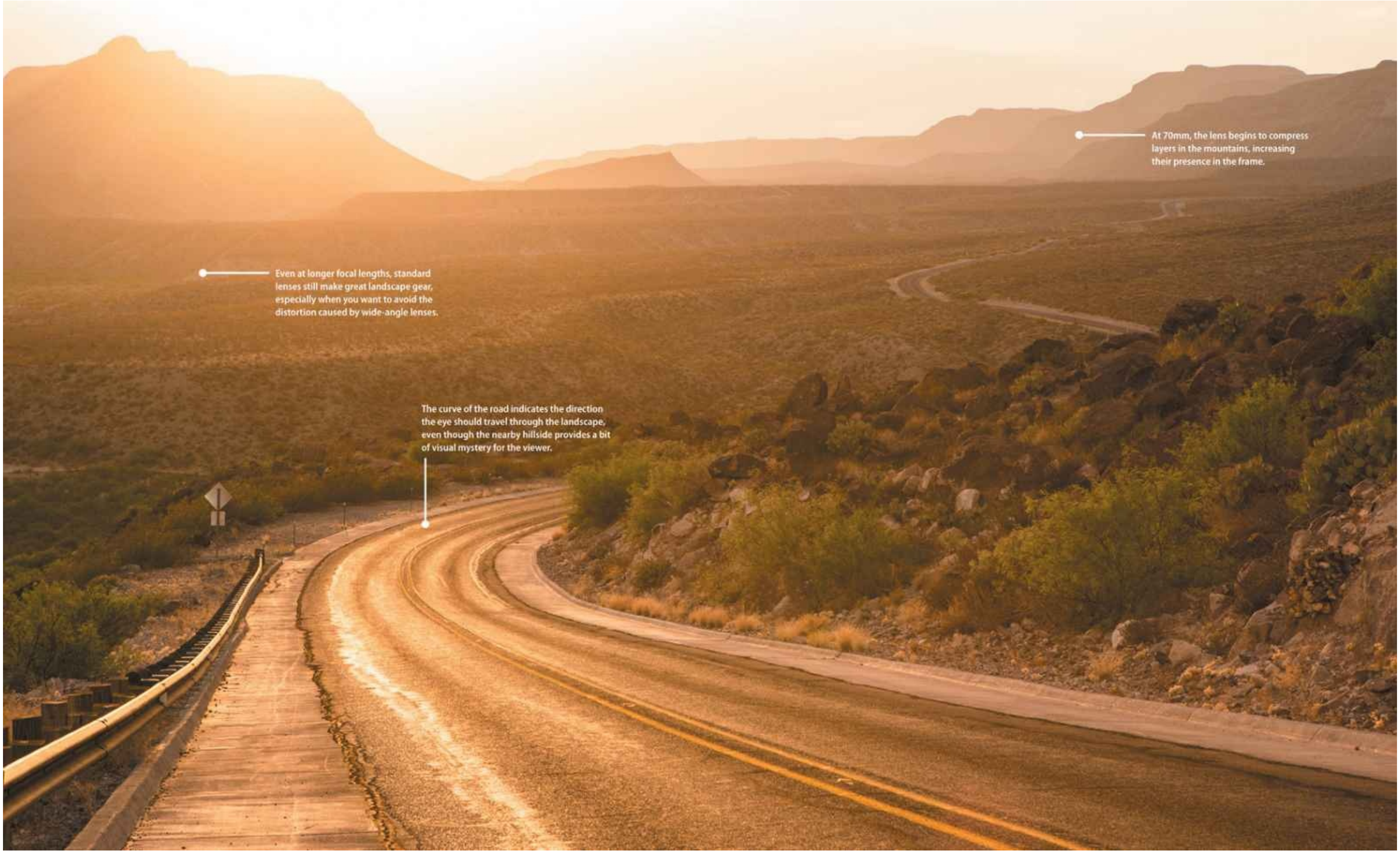
ISO 200 • 1/60 sec. • f/2.8 • 63mm

Image-making with the most popular lenses

Standard. That is a word that describes a necessity, the basis against which all else is judged, or around which everything is designed. It makes sense, then, that a large number of the lenses Nikon makes belong to the standard category.

Standard, in the case of lenses, refers to a range of focal lengths that photographers can maximize for the largest amount of image-making. All lenses (as of this writing) in this category offer photographers the most options available in one lens for making great pictures—pictures that vary in focal length but do not deviate much from the familiar human perspective.

Poring Over the Picture



ISO 100 • 1/80 sec. • f/8 • 70mm


Even at longer focal lengths, standard lenses still make great landscape gear, especially when you want to avoid the distortion caused by wide-angle lenses.
The curve of the road indicates the direction the eye should travel through the landscape, even though the nearby hillside provides a bit of visual mystery for the viewer.


At 70mm, the lens begins to compress layers in the mountains, increasing their presence in the frame.

The Go-To Lenses

If you recently purchased a Nikon camera with a DX-formatted sensor inside, you more than likely purchased an entire kit that included an AF-S DX Nikkor 18–55mm f/3.5–5.6G VR II lens. If you purchased a Nikon D600 (a full-frame, or FX, sensor camera) instead, you had the option of purchasing a kit version of the camera that included in the price an AF-S Nikkor 24–85mm f/3.5–4.5G ED VR. Both lenses are excellent standard zooms and are intended to be photographers' go-to lenses for much of their work (**Figure 4.1**).

Figure 4.1 The AF-S Nikkor 24–85mm f/3.5–4.5G ED VR (left) and the AF-S DX Nikkor 18–55mm f/3.5–5.6G VR II (right) are two popular Nikkor standard zoom lenses.

For the most part, any time you purchase a kit, the lens fits somewhere in this standard zoom range. Many folks consider standard focal lengths to be ranging from 24mm to 105mm on a full-frame sensor camera (dictated by design as opposed to a strict regulation), hence the popularity of the AF-S Nikkor 24–85mm f/3.5–4.5G ED VR for the full-frame kit mentioned above. For the purposes of this chapter, we'll go with these focal lengths as well when discussing standard lenses.

Range and Flexibility

The obvious advantage of a standard zoom—as well as a few standard primes if you choose to go that route—is its versatility. Rightly so, a standard zoom lens is built for the amount of flex a photographer demands of any one lens. I can't think of another lens that sees a variety of focal lengths actually used when shooting. As I mentioned in the previous chapter, wide-angle zooms are typically used at their widest focal length, and the opposite happens for many telephoto-zoom lenses. However, the 40-some-odd millimeters of focal length many standard zoom lenses offer (some more) tend to get used.

The standard zoom lens creeps into the wide world, especially if the lens reaches as wide as 24mm or its DX equivalent (18mm on a DX lens is comparable to a 27mm full-frame perspective). At the same time, many reach 70mm or more, which is medium-telephoto territory. Not too shabby for one lens. For photographers on a budget or wanting to carry a minimum amount of gear, the standard zoom lens is ideal. It is the foundation for the lens trinity highlighted in Chapter 1, and it is the one that I recommend all novice photographers obtain first. Standard zooms run the gamut in terms of build quality and lens speed and features.

An additional advantage of the standard zoom lens is its coverage of landmark focal lengths, including 35mm and 50mm. Both focal lengths are valuable to many photographers, particularly those interested in photojournalism. We'll spend more time discussing the 50mm lenses later in this chapter. However, it is important to mention—especially for those new to selecting gear for rental or purchase—that a standard zoom lens also allows the photographer to learn if she leans toward these two focal lengths and whether or not it is advantageous for her to purchase dedicated 35mm and/or 50mm prime lenses.

Real-Life Applications

Aside from the mechanical flexibility of standard lenses, especially standard zooms, they are also useful for a diverse range of photographic subject matter. More than anything else, this is the reason to own either a standard zoom or a couple of standard prime lenses, like a 35mm and a 50mm.

Landscape photography

Consider the flexibility of focal lengths the standard category includes, and then consider what you can adequately shoot with this range. I used to think that all of my landscape shots had to be made with an ultra-wide lens. Nowadays, I probably use 24mm as the widest focal length more than I do 17mm or wider (**Figure 4.2**). Why? It doesn't distort as much as 17mm, it's wide enough to showcase a lot of environment but tight enough to mitigate large void spaces in the sky or foreground, and probably most convenient, it is the widest extreme on a zoom lens that lets me quickly move from fairly wide to long with the twist of my wrist. This is useful for shooting in a river environment (**Figure 4.3**), where a wide perspective will provide one shot, and a tighter perspective will offer another in literally seconds (**Figure 4.4**).

ISO 100 • 1/6 sec. • f/22 • 24mm

Figure 4.2 At 24mm, a standard zoom lens is very capable of helping to create expansive landscape shots.

ISO 100 • 1/125 sec. • f/8 • 24mm

Figure 4.3 A standard zoom lens like the AF-S Nikkor 24–120mm f/4G ED VR offers up great wide views of desert riparian landscapes.

ISO 100 • 1/125 sec. • f/11 • 105mm

Figure 4.4 At the same time, the longer end of an AF-S Nikkor 24–120mm f/4G ED VR helps compress the layers of the same landscape, making for a rather different image.

Photojournalism

The standard lens range is also very popular in the photojournalism and documentary fields of photography (**Figure 4.5**). It not only allows the photographer to work closely with his subject matter, but it also forces him to produce more intimate images based on physical proximity of the camera to the subject(s) (**Figure 4.6**). Some of the most compelling images ever made were created with a 35mm or 50mm lens. Technological limitations and availability prevented photographers in the 1930s, ’40s, and ’50s from obtaining longer lenses, which would have provided a different perspective. Yet the 35mm and 50mm lenses offered these photographers a great way to tell stories from a close yet observable distance. Because of this, the standard focal length range has remained popular for this type of photography since photo essays were first popularized.

ISO 200 • 1/4000 sec. • f/2.2 • 50mm

Figure 4.5 **A 50mm lens is nice to take on a photo walk, perfect for finding candid moments, like this family walking home in Carmona, Spain.**

ISO 400 • 1/60 sec. • f/4 • 24mm

Figure 4.6 Standard lenses keep the distance between the subject and the photographer close and engaging, helping to create a feeling of actually being there for the viewer.

Portraiture

Standard focal lengths are also valuable for portraits. I know many environmental portrait photographers who consider their standard zooms the most important lenses in their bags. Whether you are shooting full-length portraits with the wider side of the lens (**Figure 4.7**) or head shots with the longer end (**Figure 4.8**), the standard zoom is as flexible for portraits as it is for landscapes. Keep in mind that the wider focal lengths exhibit higher levels of distortion and keystoning, which might prove disadvantageous for fashion work. Subsequently, many waist-up, or medium, portraits are made at the longer focal lengths in the standard range (**Figure 4.9**), including perhaps the most popular portrait focal length Nikkor makes, the 85mm (which we will touch on shortly).

ISO 100 • 1/125 sec. • f/2.8 • 50mm

Figure 4.7 **A standard lens is my favorite lens for making full-length portraits.**

ISO 200 • 1/160 sec. • f/8 • 70mm

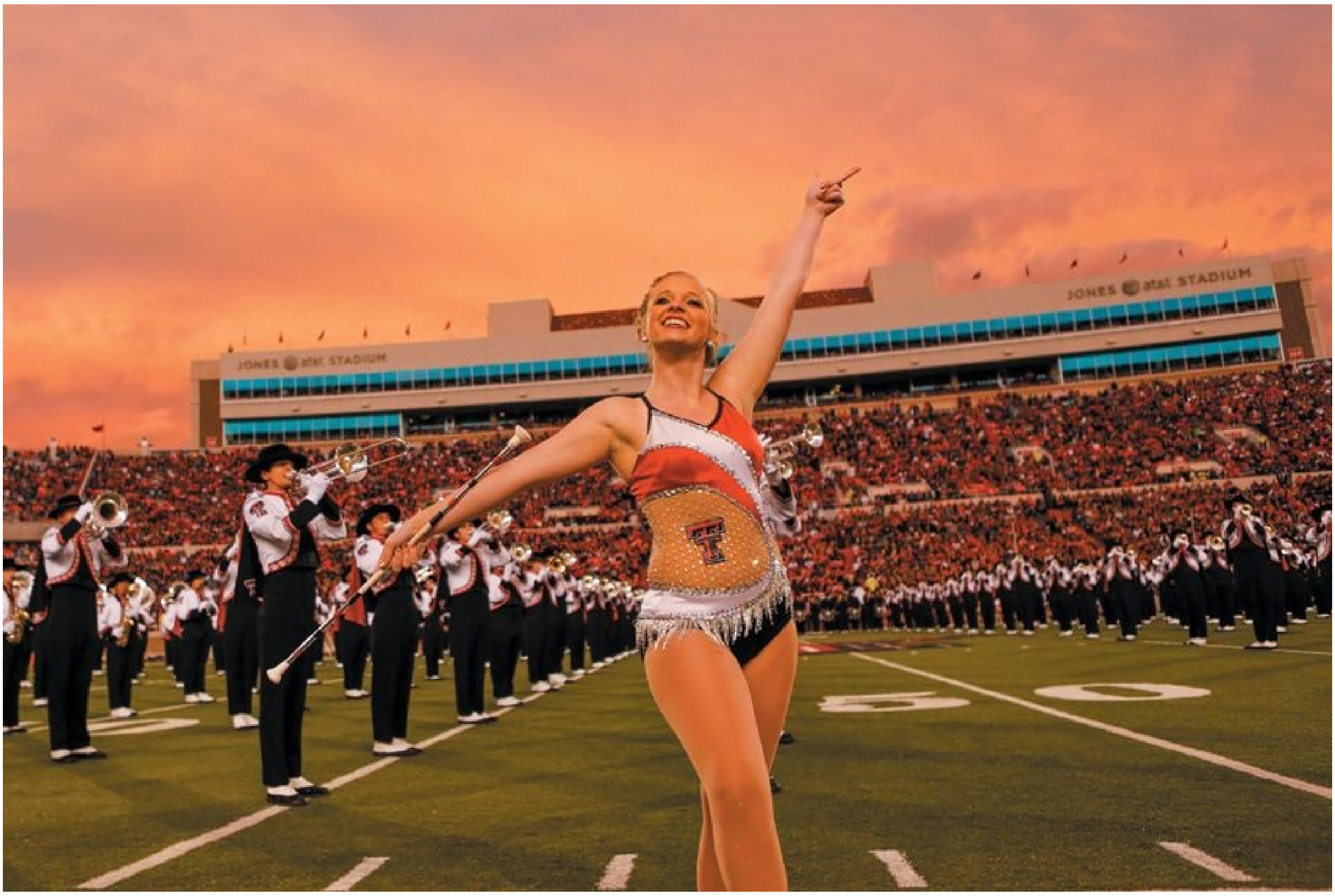
Figure 4.8 The long end of a standard zoom lens is the preferred focal length I use for studio work, as illustrated in this portrait of angler Byron Kennedy.

ISO 200 • 1/160 sec. • f/8 • 70mm

Figure 4.9 Angler Lindsay West Kennedy poses for an in-studio shot made at 70mm, a great focal length for a variety of portrait work.

Sports and wildlife photography

We can’t leave out the sports and wildlife folks here. Although the majority of sports and wildlife work is achieved using telephotos and super-telephoto lenses, I don’t know a single photographer interested in these areas who does not own a standard zoom lens or at least one lens that fits within the standard focal length range. Take American football photography, for example. When the action on the field gets closer and closer to the end zone, there is only so much a 400mm lens will offer you. A standard zoom, like the AF-S Nikkor 24–70mm f/2.8G ED, keeps the photographer prepared for a play that moves closer to her side of the field, but it is even more useful for those milder activities like halftime (**Figure 4.10**).



ISO 800 • 1/1250 sec. • f/2.8 • 24mm

Figure 4.10 A standard zoom lens is nice to have on the football field, especially for capturing the halftime show, where being close to the action doesn't mean getting knocked down.

Other sports that allow spectators a close look at the action, such as cycling, are great activities to shoot with both wide-angle and medium-telephoto perspectives (**Figure 4.11**). As so many photographers have stated over the years, being closer to the action makes for more interesting images, and a standard zoom lens or a few prime equivalents allow you to do just that.

Wildlife photography may offer a few more challenges than sports do, even at the longer end of the standard range of focal lengths, but certain subjects allow the shooter to use shorter lenses (**Figure 4.12**). Shorter focal lengths are also easier to use in conjunction with remote cameras set up to shoot wildlife from hidden areas.

ISO 100 • 1/20 sec. • f/5 • 50mm

Figure 4.11 You can make a pan of a cyclist easily with a standard lens from the side of the road.

ISO 100 • 1/200 sec. • f/9 • 73mm

Figure 4.12 Wildlife can be tough with a standard zoom lens, but with enough patience, you can make a comical shot of the smallest animals.

And, although I have never had the pleasure of testing this myself, I hear a standard zoom is ideal for underwater photography.

If I Had to Choose: AF-S Nikkor 24–70mm f/2.8G ED

I am very pragmatic about my lens choices. I want a lens to be sharp, tough, and simple. I want it to function for me in any environment—especially if it is the lens I will use the most. This is what I love about the AF-S Nikkor 24–70mm f/2.8G ED. Long considered the core of a professional's Nikkor lens trinity, the 24–70mm might be the most popular lens among photojournalists, portrait photographers, and editorial shooters alike. Over the years, it has certainly earned its status, not only because of its extremely wide-open maximum aperture, but also because of its longevity in the photographer's bag.

The 24–70mm has a great deal of competition from the very functional AF-S Nikkor 24–120mm f/4G ED VR. This is one of the most versatile lenses, given the range to 120mm. I can't imagine a better standard zoom lens for a landscape shooter. However, if your work leans more toward the editorial, where shoots occur in a variety of environments, the f/4 maximum aperture of the 24–120mm can be hindering on locations where the light is dim. This is why I prefer the AF-S Nikkor 24–70mm f/2.8G ED. Although it lacks Vibration Reduction, and it weighs more than a lens with a smaller maximum aperture, it is everything I described above—high quality and extremely reliable. The build quality is outstanding. It can take a hit, and it feels good in the hand. It is sharp at f/2.8, a major concern for lenses that open up extremely wide, and I feel confident handholding it at relatively slow shutter speeds.

The 24–70mm focal range is the one I use the most for my environmental and studio portraiture work. I find myself moving in and out of active situations, shooting portraits and other subject matter at a variety of focal lengths to test out different shots and achieve interesting angles and perspectives. The AF-S Nikkor 24–70mm f/2.8G ED will give you the flexibility to photograph everything from landscapes to portraiture, and even some wildlife. They say that gear shouldn't matter that much when it comes to vision, but I feel visually nimble with this lens.

Composing With Standard Zooms and Primes

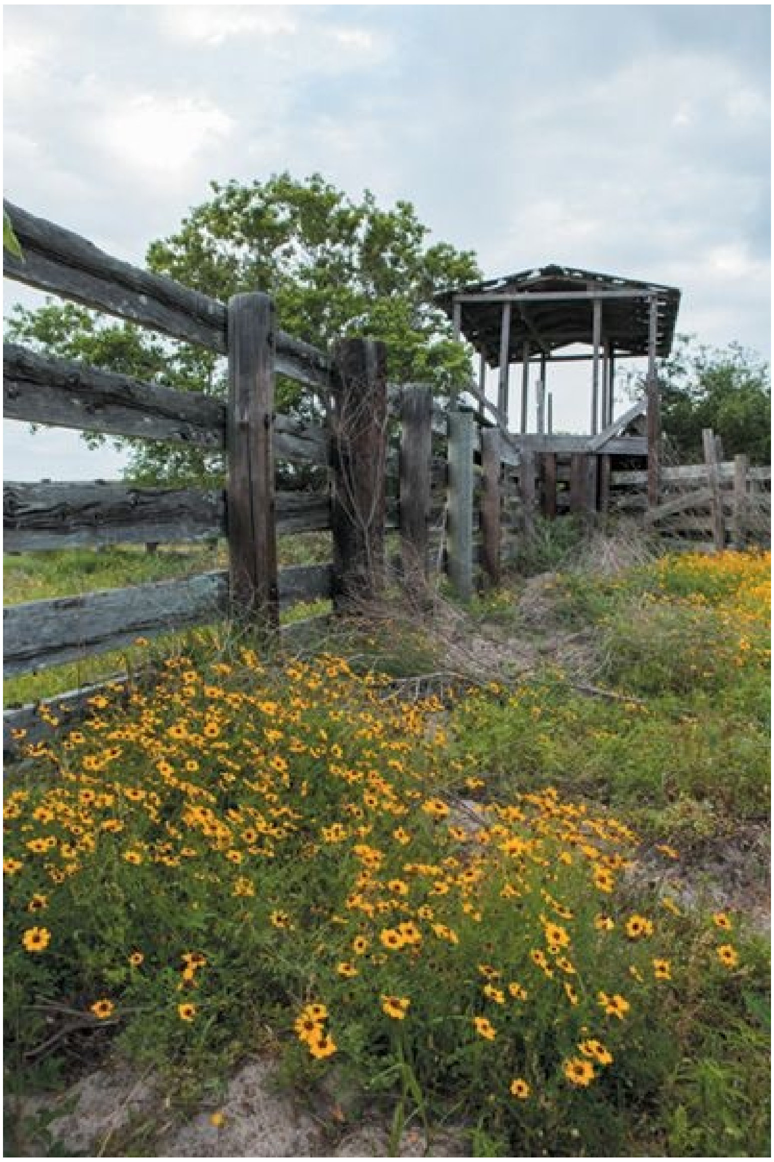
Composing with the standard range of focal lengths isn't necessarily different from composing with any lens. Finding and using strong lines, following the rule of thirds, and the like, are standard compositional techniques. However, trying to envision those things coming together with so many useful focal lengths can be daunting, especially while on location, when everything is coming at you at once, or when you want to maximize the most from your photography in a short amount of time.

Points of Interest

Envisioning shots with wide-angle lenses is relatively easy. I'm not saying wide-angles are easy to use successfully, but the wide-angle look is very familiar. Therefore, seeing in a wide perspective, where compositional interests such as lines are strongly emphasized, isn't as intimidating as *seeing* with other perspectives. It's more work envisioning images with the standard range of lenses. I am a fan of simplifying, though, and that's what I want to encourage in your own use of standard focal lengths.

Primary, secondary, and tertiary

Using all (or some) of those components of great composition covered in the previous chapter, focus on finding and providing a way for viewers to notice significant points of interest in your shots. You can use these points to guide the eye through the shot, from one direction to the other (**Figure 4.13**), or use them to isolate strong subjects over minor ones or a complementary background (**Figure 4.14**). Also consider being able to showcase multiple points of interest as if there were a visual hierarchy to how they should be physically viewed. A primary interest point—one that is the most important to the shot—may be placed in the foreground, a secondary interest point behind it (staggered to an opposite side perhaps), and a tertiary point placed as the least significant of the three (**Figure 4.15**). You may choose to have only one real point of interest in the frame, or as many as you can keep organized for the human eye.



ISO 400 • 1/40 sec. • f/8 • 24mm

Figure 4.13 The flowers in the foreground serve as a primary point of interest, which lead the eye to a secondary point—the lines of the fence—and on to the abandoned cattle station, the tertiary interest point.

ISO 320 • 1/30 sec. • f/4 • 82mm

Figure 4.14 Artist Charice Adams in front of some of her work in a local gallery. Using points of interest for composition can be as simple as one subject placed in front of the other.

ISO 400 • 1/60 sec. • f/3.5 • 24mm

Figure 4.15 With football coach Kliff Kingsbury serving as the primary point of interest, a wide-angle portrait includes the helmets as secondary interest points, and the image of the fans on the wall as a tertiary point.

Using this points-of-interest technique is by no means relegated to standard focal lengths only. I encourage everyone to use it at any focal length. However, it is a great way to simplify working with lenses and a range of focal lengths that cross the wide-to-telephoto divide. Although this divide is not over 100mm, it is incredible the visual difference one extreme has to the other (**Figures 4.16** and **4.17**).

ISO 200 • 1/8 sec. • f/22 • 35mm

Figure 4.16 At 35mm, you can see a line among diminished points of interest.

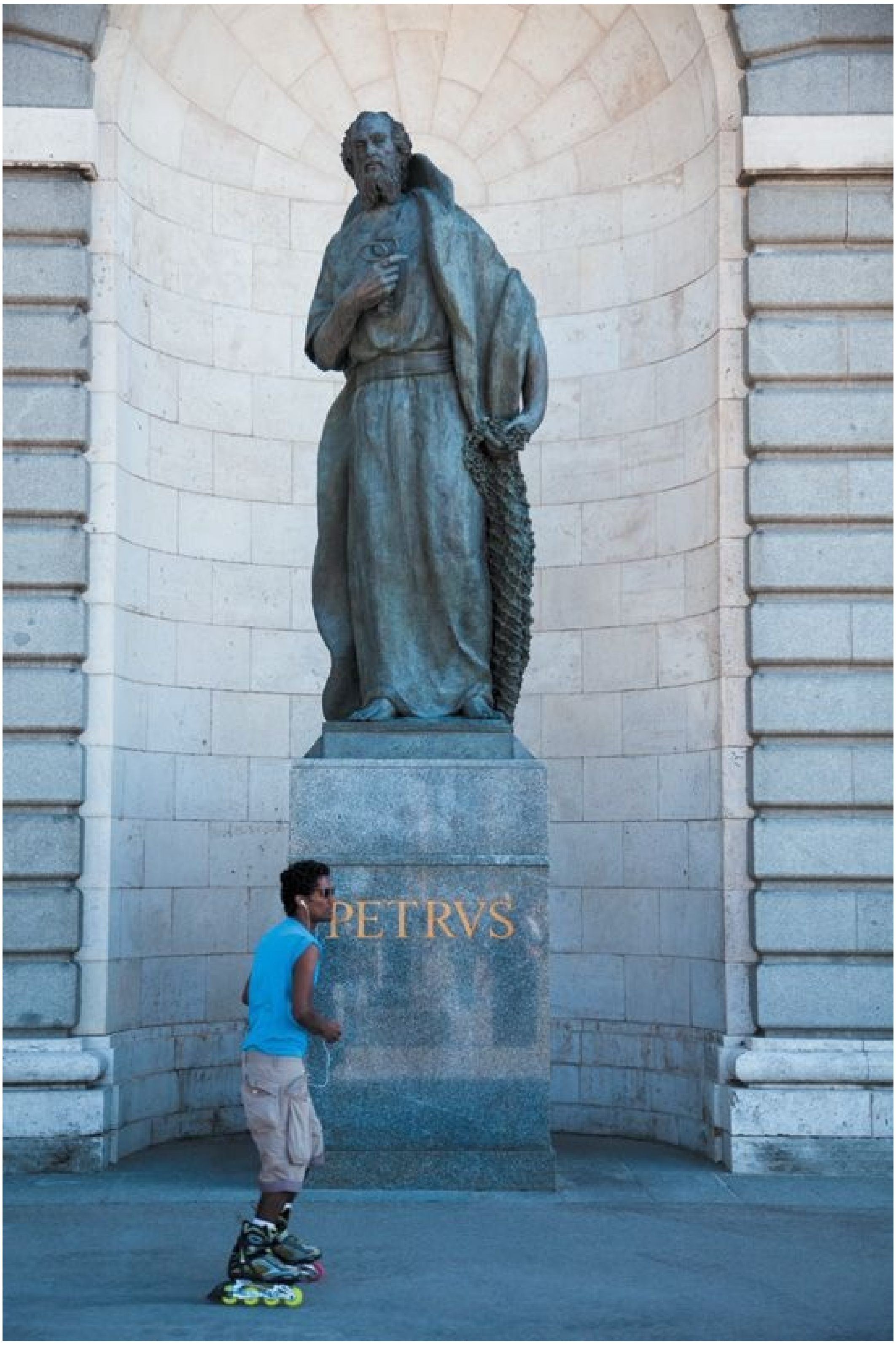
ISO 200 • 1/4 sec. • f/22 • 70mm

Figure 4.17 Yet, at 70mm, the hills in the background compress more with the foreground elements, new lines are formed, and interest points are more strongly exhibited.

No matter how much you zoom in (or out) on your subject matter, create a visual roadmap the viewer can follow from one strong point of interest to the other. Sometimes this requires looking through the lens at various focal lengths before snapping the shot.

Storytelling with lenses

An added benefit of shooting points of visual interest is the storytelling that results. In any given environment, a point of interest serves as a component of the visual story that exists in an image (or multiple images). When these points of interest are tied together, a visual narrative is created based on our own ability to comprehend their connection (**Figure 4.18**).



ISO 200 • 1/500 sec. • f/4 • 55mm

Figure 4.18 A skater riding past a statue of Saint Peter in Madrid conveys a modern society set against the backdrop of tradition.

Photography can be rather interpretive, and there's a sliding scale as to how much interpretation is required when creating *and* viewing an image (**Figure 4.19**). As image makers, though, we are at the visual helm of creating meaning with our images.

ISO 200 • 1/500 sec. • f/11 • 90mm

Figure 4.19 The gloomy look of the Rio Grande and the U.S./Mexican border in far West Texas sets up an image for quite a bit of interpretive value.

Fortunately, standard focal lengths have always been right alongside this storytelling process. Since the look of these types of lenses isn't as visually defined as, say, a 14mm or a 500mm, a photographer's attention to composition is even more key to an image's success. Combine that with points of interest that increase a viewer's understanding of a context or engage a viewer in a more active way (**Figure 4.20**), and the lens helps the photographer do what he set out to do.

ISO 100 • 1/1600 sec. • f/2.8 • 24mm

Figure 4.20 **Pushing in tight on the secondary interest point—the West Texas grassland—helps highlight the primary subject of interest, a staff member of the Texas Parks and Wildlife department.**

Framing

Although not unique to the standard range of focal lengths, one key compositional technique I find myself using quite a bit when I have a standard zoom lens in hand is *framing*. Framing, the use of content within an image to drive attention toward the subject, is a great technique to employ when you cannot rely largely on a perspective effect of a lens (**Figure 4.21**). An overhanging tree or the architecture of a building can visually frame up the subject of a portrait (**Figure 4.22**) or activity of interest.

ISO 50 • 1/1000 sec. • f/4 • 50mm

Figure 4.21 **The shadowed trees and foreground frame the Cervantes Monument in Madrid, Spain.**

ISO 100 • 1/320 sec. • f/2 • 50mm

Figure 4.22 I used an out-of-focus square column on the left to force the eye to the right and toward doctoral graduate Patrick Merle.

I often find myself using arches and walls as framing devices, where shooting at 35mm or longer allows me to keep most of the straight lines of an environment in perspective. Just about anything can serve as a frame, and sometimes all it takes to find frames is putting your eye to the viewfinder. Again, when you are not using a lens effect—e.g., wide-angle lens—to draw the eye to what is important in the frame, you'll want to take advantage of framing devices while also employing other compositional techniques with a standard lens (**Figure 4.23**).

ISO 100 • 1/800 sec. • f/2 • 50mm

Figure 4.23 Using foreground material to frame up a shot of mother and daughter—who are placed along the right-third line of the frame—creates an appealing way to direct the viewer to the right side of the frame.

Over the Shoulder

Speaking of framing, one technique that's useful with the longer extremes of standard focal lengths is what we'll call the over-the-shoulder shot. These are popular photographs of people using out-of-focus foreground material—many times they are the shoulders of other people talking to the subject—to push attention toward the person being photographed. Think corporate public-relations shots of employees enjoying their jobs (**Figure 4.24**). As cheesy as that example sounds, this technique forces the eye to look directly at the most important part of the frame without sacrificing environmental details, such as the person connected to the shoulder being used to frame the primary subject (**Figure 4.25**).

ISO 1600 • 1/60 sec. • f/2.8 • 40mm

Figure 4.24 **Over-the-shoulder shots made at longer standard focal lengths are a great way to make viewers feel as if they are with the primary subject of interest.**

ISO 800 • 1/200 sec. • f/2 • 50mm

Figure 4.25 Getting the camera low and behind the children gives the viewer a childlike perspective while encountering Santa Claus.

Of course, this type of composition is not limited to human subject matter. Nor does it have to involve a shoulder. The idea here is to draw attention to important subject matter by reducing the focus of the foreground and background (open up those apertures), de-cluttering the shot by moving in tight, and isolating the subject through simplifying the composition (**Figure 4.26**). I recommend using longer focal lengths, such as 70mm to 120mm, for these types of shots because of the increased compression. Using wider focal lengths may enlarge the size of the foreground—the lesser important subject—and create an expansive distance between it and the primary subject.

ISO 200 • 1/80 sec. • f/5.6 • 32mm

Figure 4.26 Trees surrounding the royal palace in Madrid serve as a great "shoulder," or framing device, for the magnificent building.

50mm: Normal Perspective

If you were going to get only one prime lens in the standard category, I would have a hard time recommending any lens other than the 50mm. After all, it is the standard around which the standard range of focal lengths is based (**Figure 4.27**). The 50mm is widely known as the focal length that provides a perspective most similar to human perspective. It lacks the peripheral vision we have, but in terms of the relationship between all of the content we see—their sizes and distances from each other—50mm gets pretty close (**Figure 4.28**). Hence the moniker *normal perspective*.

Figure 4.27 **The AF-S Nikkor 50mm f/1.8G is a go-to normal lens.**

ISO 200 • 1/125 sec. • f/8 • 50mm

Figure 4.28 On a full-frame (FX) camera, 50mm maintains our own eyes' perspective of our surroundings, minus our peripheral vision. You get the same perspective with a 33mm focal length on a DX crop sensor.

Also known as normal lenses, 50mm lenses have been around a while, and they're not going anywhere. I would dare say they are some of the most popular lenses available to photographers. They were the kit lenses of choice decades ago. Since they relate so well to our own eyes, 50mm lenses are extremely popular with photojournalists and documentary photographers because of their straightforward, non-manipulative perspective, their relatively small size, and their simplicity (**Figure 4.29**).

ISO 200 • 1/200 sec. • f/2 • 50mm

Figure 4.29 At 50mm, the shot can be pushed in fairly tight on carpenter Sly Luna without distorting his form or the form of other structures around him.

Like most prime lenses, 50mm lenses are also popular in part due to their extremely fast apertures. Nikon offers seven 50mm lenses as of this writing, which differ on maximum aperture openings and lens mount types, among other features (**Figure 4.30**). For the sake of brevity, the most popular 50mm lenses among consumers are the AF-S Nikkor 50mm f/1.8G and the AF-S Nikkor 50mm f/1.4G. However, each of Nikkor’s 50mm lenses has an extremely fast aperture, including one with an f/1.2 maximum aperture, the all-manual Nikkor 50mm f/1.2. Achieving fast shutter speeds in dimly lit environments is possible when you’re using apertures that open this wide (**Figure 4.31**).

ISO 100 • 1/3200 sec. • f/1.2 • 50mm

Figure 4.30 Achieve extremely low depth of field easily with any of Nikkor’s seven 50mm lenses.

ISO 400 • 1/640 sec. • f/2 • 50mm

Figure 4.31 The fast apertures of most prime glass, especially Nikkor's 50mm lenses, help in creating images in dimly lit environments, such as this jeweler's desk.

These large apertures also provide extremely shallow depth of field. Soft, creamy, out-of-focus areas are unique to apertures larger than f/2.8, and given the right distance from the subject, the 50mm lens has a look all its own (**Figure 4.32**). When moved in to capture medium waist-up shots of people in action and street photography, a 50mm lens offers superior isolation value. The depth of field is so shallow that the primary subject in focus sometimes looks as though it was digitally composited into the frame later.

ISO 100 • 1/200 sec. • f/2 • 50mm

Figure 4.32 A soft bokeh keeps the visual attention on the couple while providing a signature 50mm lens look to the entire frame.

Which 50mm Lens?

Fortunately, Nikkor gives the photographer interested in purchasing a 50mm lens a few choices. Seven, to be exact (currently listed on the Nikon website): the 50mm f/1.2, the 50mm f/1.4, the AF 50mm f/1.4D, the AF 50mm f/1.8D, the AF-S 50mm f/1.4G, the AF-S 50mm f/1.8G, and the AF-S 50mm f/1.8G Special Edition (a lens suited for the Nikon D*f* camera body). Although Nikkor offers up several versions of the same focal length, there are several functional differences. For the conscientious shopper out there, here are a few issues to consider and features to compare among the lenses before you purchase.

Although salespeople won't agree with me, the first thing to consider is cost. At just over US$100, the AF 50mm f/1.8D is several hundred dollars less than the 50mm f/1.2. Among the most popular pair of 50s, the AF-S 50mm f/1.8G is more than US$200 cheaper than the AF-S 50mm f/1.4G. Like with all gear, price usually indicates the presence or absence of certain features, which leads us to the second shopping consideration.

Autofocus: Not every Nikkor 50mm lens has it. Although the most expensive lens (the 50mm f/1.2) contains the most glass and has the widest maximum aperture, it lacks autofocus. So does the 50mm f/1.4. Only those lenses with either an AF or AF-S in their name have the ability to autofocus, and only AF-S lenses actually contain the necessary focusing motor to do so. AF lenses, which rely on an in-camera focusing motor, can only autofocus when coupled with certain camera bodies. Consumer camera bodies like the D3200 and the D5200 do not have such a motor and won't enable autofocus on AF-only lenses. So, if autofocus is something you want, the AF-S versions of the 50mm focal length (as well as all other lenses) are the only ones worth comparing.

The last issue to consider is the size of the maximum aperture for all seven lenses. This seems like a crucial issue, but when you are comparing aperture values that are the widest for all Nikkor lenses—varying only one stop from f/1.8 to f/1.2—it becomes the least of all the issues. Certainly, f/1.2 offers incredibly shallow depth of field when the aperture is wide open, but so do f/1.4 and f/1.8. The bokeh is a bit smoother for the f/1.4 and f/1.2 lenses.

So, which one do you buy? Find the combination of features (including price) most important to you and go with the lens that offers it. The AF-S 50mm f/1.4G and the AF-S 50mm f/1.8G are both great deals. They are both small and fairly light lenses, making them easy to transport. They both autofocus well, and although they may not be as hardy as their manual-focus brethren, they are still tough enough to take a hit. If you need a lens for a variety of scenarios, either one will get the job done. Some say that the f/1.8G is a bit sharper than the f/1.4G at nearly half the price (it is worth comparing for yourself, if you can test both in the store). The all-manual focus and AF versions of the focal length are nice, but given the projection of all things digital, I advise going with the lenses that offer you the most flexibility. Note that you'll likely find only the AF-S versions in camera stores.

85mm: Standard Portrait Lens

Want to cause lens envy? Roll into a photography party (do they have those?) with an AF-S Nikkor 85mm f/1.4G on your camera. Heck, even the lesser expensive—but sharp as a tack—AF-S Nikkor 85mm f/1.8G will have people looking (**Figure 4.33**). The first thing people will think: portrait shooter (regardless of whether or not that's how you would describe your work).

Figure 4.33 The AF-S Nikkor 85mm f/1.4G is one of three Nikkor 85mm lenses great for portraiture.

Why It's Great

In terms of it being the perfect portrait lens, the 85mm focal length has several things going for it. First, in any iteration, it is an extremely fast lens. Like the Nikkor 50mm lenses, Nikkor's three 85mm lenses—the AF Nikkor 85mm f/1.4D, the AF-S Nikkor 85mm f/1.8G, and the AF-S Nikkor 85mm f/1.4G—sport wide opening apertures and an incredibly shallow depth of field. (I mention only three of the five 85mm lenses in the current Nikkor lineup because the fourth is a perspective-control lens and the fifth is a macro photography lens, both of which I will highlight in Chapter 6.)

Popular among environmental portrait photographers, wedding shooters, children photographers, and folks producing great Hollywood head shots, Nikkor's 85mm lenses offer superb bokeh (**Figure 4.34**). When pushed in tight to the subject and left wide open, the lens makes just about everything out of focus except for the focal point on a subject's face (**Figure 4.35**). Distracting backgrounds are manipulated into abstract blobs of color and light with these lenses, perfect for cleanly isolating your subject in the frame.

ISO 200 • 1/160 sec. • f/1.8 • 85m

Figure 4.34 **Great for tight portraits, the Nikkor 85mm lenses are made for taking advantage of light as well as interesting backgrounds.**

ISO 200 • 1/500 sec. • f/1.8 • 85mm

Figure 4.35 Backgrounds fade easily into beautiful, blurred color and light when any of the Nikkor 85mm lenses is pushed close to its minimum focusing distance from the subject.

The second feature of this great-for-portraiture focal length is that it is long enough to create a bit of foreground-to-background compression, but it is still short enough that the photographer can stay relatively close to her subject. The compression caused by the lens is nice because it helps simplify shots, particularly when combined with very shallow depth of field (**Figure 4.36**). Keep an eye out for sharp, clean backgrounds. The proximity of the shooter to the subject is nice because it enables a tight relationship between the two. They can have conversations easily. The photographer can give instructions without yelling and can simply make the experience comfortable for the subject, who may feel removed from the action if the shooter is farther away than an 85mm focal length will allow for a head shot or other tighter portraits.

ISO 100 • 1/400 sec. • f/2.8 • 85mm

Figure 4.36 There is just enough compression at 85mm to keep the background close to the subject, but not so much that it becomes decontextualizing should you choose not to use a wide-open aperture.

The Cost of Owning an 85mm

Like the Nikkor lineup of 50mm lenses, the three 85mm lenses differ on a few features and price points. The AF-S Nikkor 85mm f/1.8G is an affordable iteration of the lens, featuring a lighter construction and of course a smaller maximum aperture than the f/1.4 versions of the focal length. However, the f/1.8 version is very sharp.

Nikkor's AF 85mm f/1.4D IF is a more traditional medium-telephoto that is a (still available) predecessor to the updated AF-S Nikkor 85mm f/1.4G, which technologically is comparable to the f/1.8G. The difference in price, though, between the f/1.8G and the f/1.4G? As of this writing, around US$1,200. But, for that price, the f/1.4G comes with a very stout construction, nano-crystal coating on the glass, and the admiration of all of your photo buddies (well, maybe…).

Many photographers, including myself, lean toward the more affordable AF-S Nikkor 85mm f/1.8G. (My photography style just doesn't justify the expense of the AF-S Nikkor 85mm f/1.4G.) Both 85mm lenses are excellent pieces of glass, and a choice between them—like with all lenses—is based on personal preference.

Nail the Focus With Wide Apertures

With the extremely wide maximum apertures of Nikkor's standard prime lenses, like the AF-S Nikkor 50mm f/1.4G and f/1.8G and the AF-S Nikkor 85mm f/1.4G and f/1.8G, it is worth pointing out that they are sometimes difficult to focus. You may think a particular area of your image is in focus while the aperture is wide open but then realize you are off when you see the images on the computer later.

Lenses that open up extremely wide—especially the f/1.4 variety—create planes of critical focus with depths of field that in some cases are less than a couple inches deep. The closer you move the lens to your subject, the seemingly shallower that depth of field becomes. So, it makes sense that when you first focus on someone's eyes and then shift the camera (on axis, no less) to compose your shot, the plane of critical focus may move off of the original point of focus. At this point, the focus may be more on the subject's nose, and with such shallow depth of field, you miss the shot because the eyes are slightly out of focus. This is not as much of a problem with lenses that open only as wide as f/2.8 or less because the shallowest depth of field created with these lenses is much deeper than at f/1.4.

So, what do you do about it? Old-school shooters would recommend just dealing with it. Shoot at a more stopped-down aperture, which is what I usually end up doing (**Figure 4.37**), work harder at seeing and nailing focus, and possibly go to manual focus (a great recommendation—just don't take deep breaths while focusing). Others recommend re-calibrating your camera's autofocus to focus in front of or behind the plane of critical focus in order to compensate for this type of shifting. Many Nikon cameras allow users to fine tune focusing marks like this, and all it takes is knowing whether or not you are focusing in front of or behind where you think you are (and checking the operator's manual). Simply put, there is no go-to fix for this issue; it's just good to know that it is an issue that you will more than likely encounter.

ISO 100 • 1/80 sec. • f/2 • 50mm

Figure 4.37 **I often shoot at f/2 when I'm using a fast 50mm lens and want to mitigate a distracting background.**

The All-Around Lens

Every year I teach a 15-day editorial field course to 14 students at the university. At least one student will ask me if I can recommend one lens that will work for the large majority of photography we produce in the class (but won't break the bank). Having had a few meals on the cheap while I was in college, I sympathize with their wanting to save money. Luckily, I'm quick to recommend the AF-S DX Nikkor 18–300mm f/3.5–5.6G ED VR (**Figure 4.38**).

Figure 4.38 For Nikon DX crop-sensor-camera users, the AF-S DX Nikkor 18–300mm f/3.5–5.6G ED VR is the perfect lens—focal length flexibility at a great value.

The 18–300mm focal length range is, for one thing, incredibly long. Not only is it long, though, it offers the photographer some of the most useful focal lengths he will need and use, all in one lens. A fairly wide perspective all the way to reaching telephoto perspective lets the photographer make the most of many different environments and types of photography. It truly is an all-around lens. To be honest, I have always been skeptical of lenses that try to cover this much ground in a zoomable package. For example, a lens like the AF-S Nikkor 80–400mm f/4.5–5.6G ED VR spooks me because of the potential effect such a long zoom range has on image sharpness. However, the AF-S DX Nikkor 18–300mm f/3.5–5.6G ED VR has not given me cause to shudder, especially at a price point below US$1,000.

Another nice thing about a lens like the AF-S DX Nikkor 18–300mm f/3.5–5.6G ED VR is that it doesn't have to be removed from the camera body much, if at all. This comes in handy when you might need to change lenses in poor weather (think rain or a dust storm) that may pose great risk to your camera body.

Keep in mind that the lens highlighted here is a DX lens, which is optimized for Nikon bodies that contain a DX (cropped) sensor. If you have a full-frame (FX) camera, the AF-S

DX Nikkor 18–300mm f/3.5–5.6G ED VR is still functional, but the camera will enable a DX crop mode that reduces real estate of the sensor on which the image is projected.

Chapter 4 Assignments

Here are a few aesthetic and technical workouts that will help you improve your vision with, and operation of, the many lenses in the standard 24mm to 105mm range.

Working up interest

Let’s flex some serious composition muscles. Find a location that is important to the surrounding area. It could be something cultural like a fountain statue or museum, or something playful like a piece of playground equipment or outdoor basketball court. When you are on location, search for different ways to compose shots of it. Start dissecting the different kinds of subject matter that make up the location. Determine what is the most important. Consider that a primary interest point to which you want to direct the eye or use as an initial leading device to other areas of the location. After identifying the primary subject, find secondary and even tertiary points of interest to build into your composition. Again, use them to either lead the eye to the primary interest point, or use them to compositionally complement a dominating foreground interest point. Make several shots using different points along different lines, and think about foreground, midground, and background. To make it even more interesting, add a person (or people) to the mix.

Just be normal

On your next photo outing, shoot only at 50mm. That’s it. For those of you using a DX crop-sensor camera like a D5200 or a D7100, you’ll need to shoot at 33mm (or close). Get a feel for only shooting at this focal length and from this perspective. We often go really wide or really long, and we need practice seeing and shooting at normal perspective. Assess the size and distance between all of the components of the subject matter, gauge the distances you need to be from subjects for certain types of shots, and as always, work the frame’s composition!

Shoot shallow

While you are out on that photo walk, spend some time shooting with the aperture wide open. This works best if you have a 35mm, 50mm, or 85mm prime lens. Set the lens to its maximum aperture, and work at varying distances on one subject to nail focus. If possible, use a human subject and focus on her eyes. Once you do so, re-compose for the shot, and see how far your focus drifted (if at all) away from the eye. Did the focal plane move forward or backward? Determine how you might best be able to overcome this disadvantage of the extremely wide aperture settings inherent in many primes. Move to manual focus to see if you can eyeball it any better. Work on this technique continually to ensure you do not come away with out-of-focus shots.

Share your results with the book’s Flickr group!
Join the group here: www.flickr.com/groups/nikonlenses_fromsnapshotstogreatshots

5. Telephotos

ISO 200 • 1/500 sec. • f/5.6 • 400mm

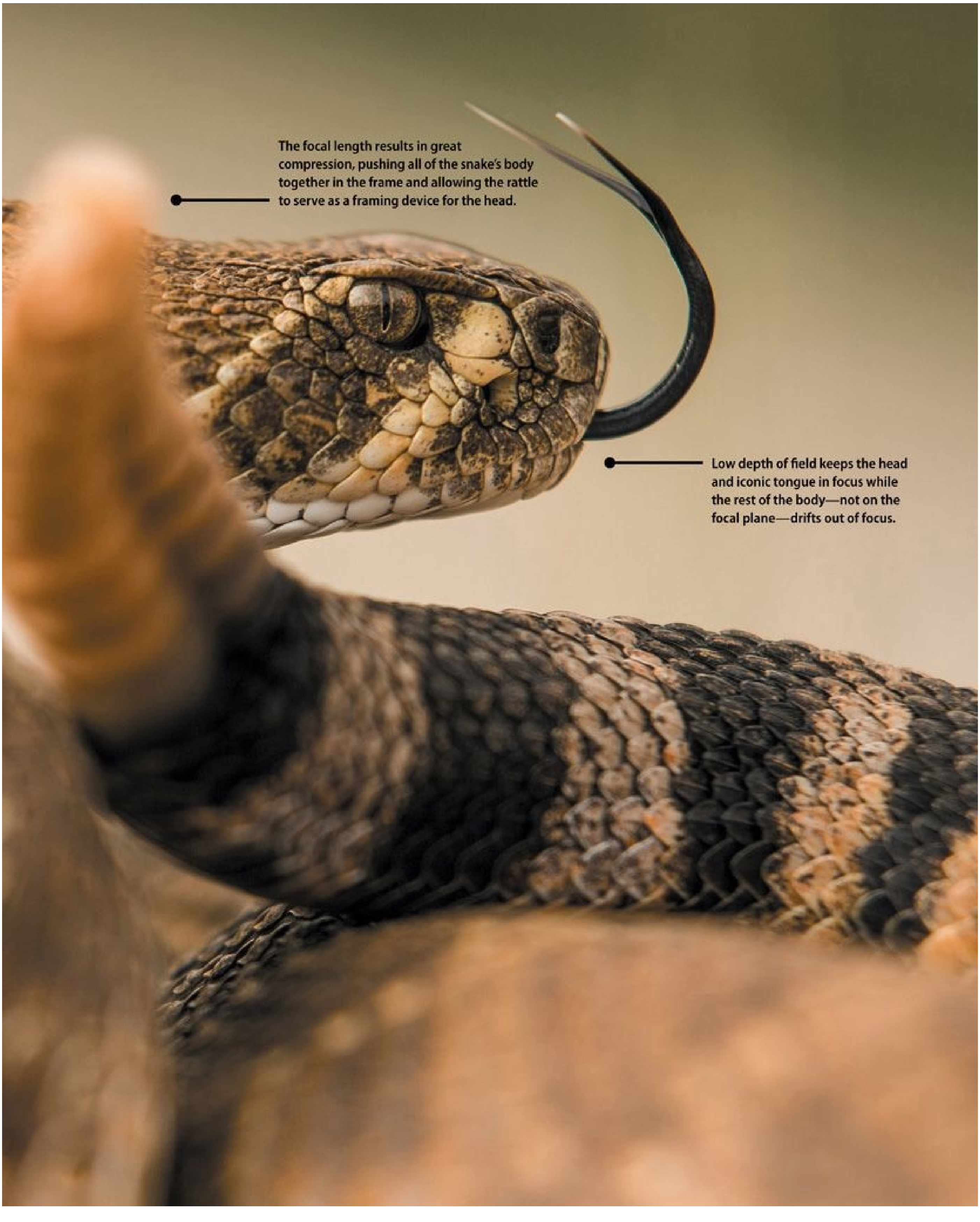
The big glass

“Whoa!” That’s usually the response I get from folks when I show up to photograph a local sporting event with a large black telephoto lens in tow. It doesn’t matter which telephoto lens it is—they all draw attention. But that’s not what the longer lenses in the Nikon lineup are for. Sure, they may attract a few more eyes than the average standard lens, but they also fulfill a useful purpose in the photographer’s camera bag: Literally, they are for reaching out.

Poring Over the Picture

ISO 50 • 1/320 sec. • f/3.5 • 200mm

Although it doesn't sound very long, 200mm kept me at a safe distance from a potentially dangerous encounter.


The focal length results in great compression, pushing all of the snake's body together in the frame and allowing the rattle to serve as a framing device for the head.
Low depth of field keeps the head and iconic tongue in focus while the rest of the body—not on the focal plane—drifts out of focus.

Go Big or Go Home

Telephoto focal lengths generally start at 105mm and, for Nikon, reach 800mm. Generally speaking, telephotos are heavier and larger than other Nikon lenses, although some telephotos with smaller maximum apertures are similar in size to standard lenses. Telephotos with large maximum apertures are bulky, but with that size comes a world of focal lengths perfect for a variety of special purposes (**Figure 5.1**). The longer the focal length, the more specialized a lens becomes, and while not any one lens is completely relegated to a particular type of photography, we can look at popular uses for some lenses and focal lengths.

ISO 200 • 1/800 sec. • f/2.8 • 400mm

Figure 5.1 The sports-photography world wouldn't be the same without the 400mm focal length.

Medium Telephoto Zooms and Primes

As part of many photographers' trinity of lenses, a medium telephoto holds a special place in the camera bag. A medium telephoto zoom makes for a nice lens purchase after the initial camera and standard zoom lens, when a photographer wants to reach out a little farther than his standard zoom allows. Probably the most popular segment of the telephoto lenses and focal lengths Nikon offers, medium telephotos typically range from 70mm to 200mm. Nikon currently makes several variations on this focal range. Some of the more popular lenses include the AF-S DX VR Zoom-Nikkor 55–200mm f/4–5.6G IF-ED and the AF-S DX Nikkor 55–300mm f/4.5–5.6G ED VR (for crop-sensor camera bodies) and the AF-S VR Zoom-Nikkor 70–300mm f/4.5–5.6G IF-ED, the AF-S Nikkor 70–200mm f/2.8G ED VR II, and the AF-S Nikkor 70–200 f/4G ED VR. These lenses are so popular that Nikon makes several versions that differ on aperture size, focal length range, and Vibration Reduction capability.

Why are these lenses in such demand? Medium telephotos (zoom or prime) are extremely useful lenses for just about any genre of photography. A 70–200mm or 70–300mm lens can be used creatively and effectively for everything from landscape (**Figure 5.2**) to portrait photography (**Figure 5.3**), from photojournalism (**Figure 5.4**) to sports and wildlife (**Figure 5.5**). Throw on an extension tube or two and you have a great close-up lens (**Figure 5.6**). (We'll talk more about close-up lenses in Chapter 6.)

ISO 100 • 1/5 sec. • f/22 • 98mm

Figure 5.2 Longer focal lengths allow you to concentrate on composition that is not necessarily right in front of you.

ISO 100 • 1/80 sec. • f/2.8 • 100mm

Figure 5.3 **The compression at long focal lengths helps bring many elements together in an environmental portrait.**

ISO 100 • 1/1000 sec. • f/2.8 • 135mm

Figure 5.4 **Telephotos often keep the photographer from intruding on the authentic unfolding of events (and they keep her safer from potential danger).**

ISO 100 • 1/1600 sec. • f/2.8 • 200mm

Figure 5.5 Telephoto lenses work well for wildlife and sports photography.

ISO 200 • 1/400 sec. • f/2.8 • 180mm

Figure 5.6 **An affordable extension tube can turn a telephoto lens into a very effective close-up (macro) lens.**

For Portraits: 85mm, 105mm, 135mm, or 200mm?

From medium telephoto to full-on telephoto, Nikon makes several lenses that are great for portraiture. In the previous chapter, I highlighted the 85mm primes as the iconic portrait lenses for wedding, family, and cultural photographers. The 85mm is not exclusive for portraits, though. Many folks decide—based on price, flexibility, and other factors—that other lenses may suit their needs better.

The 105mm (of which Nikon makes two versions) is a great focal length for portraiture (**Figure 5.7**). The AF-S Micro-Nikkor 105mm f/2.8G IF-ED is extremely sharp, and it is about half the cost of the AF-S Nikkor 85mm f/1.4G. At 105mm, the photographer does not have quite the intimacy with the subject as she would have with an 85mm, but she's not as removed as she would be using a 300mm. Nikon also makes the AF DC-Nikkor 135mm f/2D lens, specifically designed for portrait work as it has a special Defocus Image Control. This feature allows the photographer to control how the out-of-focus parts of the foreground or background look.

ISO 400 • 1/100 sec. • f/2.8 • 135mm

Figure 5.7 The 135mm is a nice alternative to the 85mm or 70–200mm for many portrait shooters. Although longer than 85mm, 135mm still keeps you at a nice talking distance from the subject.

Another great focal length for portraits is 200mm. With more compression and longer reach, the 200mm is the bread-and-butter portrait length for some (**Figure 5.8**). Sometimes the distance between subject and shooter is appealing, allowing subjects to be themselves by themselves, particularly for full-length portraits. At the same time, 200mm makes for a great head-shot focal length, easily throwing the background into an abstract blur of light and color (**Figure 5.9**).

ISO 100 • 1/500 sec. • f/2.8 • 200mm

Figure 5.8 **I favor 200mm for many portraits due to its ability to bring an abstract background seemingly close to the subject.**

ISO 100 • 1/40 sec. • f/2.8 • 200mm

Figure 5.9 **At 200mm, this bridal head shot easily isolates the subject’s face from a potentially distracting background.**

Nikon offers several ways to get into the 200mm focal length. The most affordable options are the AF-S DX Zoom-Nikkor 55–200mm f/4–5.6G ED and the AF-S DX Nikkor 55–300mm f/4.5–5.6G ED VR (for crop-sensor camera bodies) and the AF-S

VR Zoom-Nikkor 70–300mm f/4.5–5.6G IF-ED. The AF-S Nikkor 70–200mm f/2.8G ED VR II and the AF-S Nikkor 70–200 f/4G ED VR are both quite expensive, but the f/4 version is US$1,000 less than the f/2.8 version. There are also the AF-S Nikkor 200mm f/2G ED VR II and the AF-S Micro-Nikkor 200mm f/4D IF-ED lenses, but they come at a premium price, especially the 200mm f/2. For the money, the 70–200mm f/4 lens may be the best option. More expensive than many other versions of the group, it is still much less than the f/2.8 version and gives you a constant f/4 throughout the focal range.

Folks buying an AF-S DX Zoom-Nikkor 55–200mm f/4–5.6G IF-ED or the AF-S VR Zoom-Nikkor 70–300mm f/4.5–5.6G IF-ED to photograph their children playing sports are happily surprised when they see how functional the lens is for portraits. Landscape photographers employ these focal lengths for a number of reasons, including quasi-*macro* work (zooming in from a long distance on something small, such as a flower) and creating patterns and textures in long shots with compression (see later in the chapter).

Sports photographers use these lenses to concentrate on action that gets within a range too tight for their super-telephoto lenses. And just about every photographer enjoys being able to throw a background out of focus easily when zoomed into a subject and using a wide-open aperture (**Figure 5.10**). Medium telephotos are extremely versatile lenses, just as long as the shooter accommodates for the extra focal length, which is greater than on most standard zooms.

ISO 400 • 1/500 sec. • f/2.8 • 165mm

Figure 5.10 The shallow depth of field, resulting from a long focal length and wide maximum aperture, highlights the subject and combines it with a colorful, aesthetically pleasing background.

300mm: A Bit More Reach

There was a point in my career when I honestly didn't know what to do with 300mm. I knew it was the long end of the popular AF-S VR Zoom-Nikkor 70–300mm f/4.5-5.6G IF-ED lens, but I didn't have much use for it in my landscape work, and it was a tad bit too long for my portraiture work (the lens put me too far from subjects). At 200mm, I could be productive, but not at 300mm. As it turns out, my problem had to do with how I was seeing my images before making them, and to some degree, the content I was shooting.

In the grand scheme of telephoto focal lengths, 300mm is just a bit more reach than 200mm. But in that distance, the lens goes from being an all-around image maker to somewhat of a specialty lens. It's not so specialized that it can only be used for one thing, like wildlife, but this long focal length moves into super-telephoto range. When I started photographing animals (**Figure 5.11**) and sports (**Figure 5.12**) and started concentrating on landscape composition that took full advantage of the long focal length's great compression (**Figure 5.13**) and ability to isolate individual subjects (**Figure 5.14**), I entered into another world of photography.

ISO 100 • 1/500 sec. • f/4 • 300mm

Figure 5.11 With more compression than 200mm, a 300mm lens readily pulls the background and foreground together, adding the brown calf as another point of interest in the frame.

ISO 320 • 1/400 sec. • f/4 • 300mm

Figure 5.12 Little League baseball is a great environment for the 300mm focal length. The photographer can get closer to the action than he can at college or professional sports events, which generally require at least 400mm.

ISO 200 • 1/8000 sec. • f/4 • 300mm

Figure 5.13 **A large thunderstorm brewing miles away from the church creates an ominous background for the steeple.**

ISO 100 • 1/500 sec. • f/4 • 300mm

Figure 5.14 Pushed in tight, 300mm is a great focal length for isolating subject matter against a soft background.

Many popular starter telephoto lenses include 300mm, such as the AF-S VR Zoom-Nikkor 70–300mm f/4.5-5.6G IF-ED mentioned in the previous section, as well as the more expensive AF-S Nikkor 28–300mm f/3.5–5.6G ED VR, the AF-S Nikkor 80–400mm f/4.5–5.6G ED VR, and the AF-S Nikkor 200–400mm f/4G ED VR II. I personally like the AF-S Nikkor 300mm f/4D IF-ED. Although pricier than most of the zoom lenses, it is tough as nails, extremely sharp, and very light, especially compared to its heavyweight (and much pricier) cousin, the AF-S Nikkor 300mm f/2.8G ED VR II. I primarily use it for sports and some wildlife, and occasionally landscapes.

400mm: The Ultimate Telephoto?

Designated as the little guy in the super-telephoto range, the 400mm is often considered the ultimate telephoto lens. I would not call it an all-around lens, but it is one of the most useful lenses for wildlife and sports (especially sports).

The AF-S Nikkor 400mm f/2.8G ED VR

Every other Saturday in the fall, I pack up my camera bags and head up to Texas Tech's football stadium. As 60,000 fans fill the seats, roughly 40 photographers start preparing for the game on the field. All of a sudden, you see numerous large lenses placed on monopods.

Possibly the most iconic lens in sports, the AF-S Nikkor 400mm f/2.8G ED VR is noticeable by fans and shooters alike (**Figure 5.15**). And it is a performer. Fast to autofocus, it is the optimum chunk of glass for sports when paired with a camera that has a great autofocus system (**Figure 5.16**). For the focal length, the AF-S Nikkor 400mm f/2.8G ED VR also has an outrageously fast aperture (**Figure 5.17**) for extremely low depth of field. This comes in handy when shooting sports in dimly lit environments, such as most high school football and soccer fields. The shallow depth of field is nice, creating great separation between the subject and the background, and the wide aperture opening allows the fastest shutter speed possible with all of the light hitting the sensor (**Figure 5.18**).

Figure 5.15 The AF-S Nikkor 400mm f/2.8G ED VR is a treasured lens for many sports and wildlife photographers.

ISO 400 • 1/1600 sec. • f/2.8 • 400mm

Figure 5.16 The 400mm f/2.8's quick Silent Wave Motor (SWM) ensures snappy autofocus when engaged on quick subject matter.

ISO 100 • 1/2500 sec. • f/2.8 • 400mm

Figure 5.17 At f/2.8, the background fades into an abstract indication of the environment in which the rider is competing.

ISO 3200 • 1/1250 sec. • f/2.8 • 400mm

Figure 5.18 Under dim stadium lighting, f/2.8 apertures are almost necessary given the low amount of light for fast shutter speeds on high action.

Shop around

There's only one big disadvantage to the AF-S Nikkor 400mm f/2.8G ED VR: It is super expensive! As of this writing, a new lens will set you back US$9,500 (the newer AF-S Nikkor 400mm f/2.8E FL ED VR costs US$12,000). The other disadvantage is its weight; the new AF-S Nikkor 400mm f/2.8G ED VR comes in at over 8 pounds, which is 2 pounds lighter than the previous version of the lens (**Figure 5.19**).

Figure 5.19 The AF-S Nikkor 400 f/2.8G ED VR and the AF-S Nikkor 300mm f/4D IF-ED: As you can see, there is a huge difference in size between the two.

A 400mm f/2.8 really is for those committed to professional photography (or for those with deep pockets who appreciate high-quality gear). I know I couldn't do without one when shooting sports. Fortunately, Nikon makes a few more lenses reaching 400mm that are less expensive without sacrificing build quality. Two zoom lenses offer great focal length flexibility, the AF-S Nikkor 200–400mm f/4G ED VR II and the AF-S Nikkor 80–400mm f/4.5–5.6G ED VR. The 200–400mm is a powerhouse for wildlife and sports photographers; however, while its price point is far below that of the AF-S 400mm f/2.8, it still costs US$7,000. The 80–400mm offers the most flexibility of the lenses that reach 400mm, but at f/4.5–5.6, it is not as quick, which can be an issue when shooting fast-moving sports in low light.

500mm, 600mm, and 800mm: Extremely Long Glass

In my short three-season tenure of photographing NCAA football, I've seen a lot of 400mm f/2.8 lenses. However, I've only seen two photographers—two *Sports Illustrated* shooters—come on the field with anything longer. They both carried not only 400mm f/2.8s but a 500mm and a 600mm. You can also assume they each had an assistant to carry the load. With 400mm lenses, the nice images start at about the 50-yard line if you are standing in the end zone, but these guys could shoot clear down the field without a problem. Shooting with lenses over 400mm allows you to get close to the action without getting trampled or run over (**Figure 5.20**).

ISO 400 • 1/1000 sec. • f/5.6 • 500mm

Figure 5.20 Shooting with extremely long glass often means being able to position yourself where you could not with shorter focal lengths.

I'm bunching Nikon's AF-S Nikkor 500mm f/4G ED VR, AF-S Nikkor 600mm f/4G ED VR, and AF-S Nikkor 800mm f/5.6E FL ED VR together in a section because of their increasingly specialized use. They are heavy, a bit unwieldy for most folks, and like the AF-S Nikkor 400mm f/2.8E FL ED VR, very expensive. The question to ask yourself is, "Can I use a 500mm, 600mm, or 800mm lens enough in my work to justify its US$10,000-plus price tag?" Although many of us would like to answer, "YES!," I imagine it might be difficult to do so.

All that said, these lenses are highly functional for the right shooters, such as wildlife photographers. I know wildlife photographers who swear by their AF-S Nikkor 500mm f/4G ED VR lenses for capturing everything from rabbits to deer to bears (**Figure 5.21**). Wildlife photography is hard work outside the zoo, and the incredible reach each of these lenses offers is suitable for animals that can be a bit unpredictable or skittish.

ISO 200 • 1/500 sec. • f/4 • 500mm

Figure 5.21 Many large-mammal wildlife photographers list the 500mm focal length as their favorite due to the wariness of their subject matter.

Bird photographers are especially drawn to these longer focal lengths due to the size of—and distance from—their subject matter (**Figure 5.22**). A super-telephoto lens lets a photographer shoot in tighter on wildlife from a distance, making for more authentic images of the animals. It also makes it easier to photograph potentially dangerous animals, such as bears or lions, safely.

ISO 800 • 1/500 sec. • f/4 • 500mm

Figure 5.22 Photographing animals like the small and skittish lesser prairie chicken is all but impossible without focal lengths longer than 400mm.

If I Had to Choose: AF-S Nikkor 70–200mm f/2.8G ED VR II

To be honest, I'm not sure I have a favorite lens in this category. However, if there was only one lens, it would hands down be the AF-S Nikkor 70–200mm f/2.8G ED VR II (**Figure 5.23**). I like to think that every lens in my bag is a workhorse, but this one is the Clydesdale. I've used this lens for every assignment I've had over the years. Landscapes, portraits, touchdown catches, western diamondback rattlesnakes—I find a way to use this lens for just about everything I shoot. You will find this lens or one of its iterations in most professional Nikon users' bags.

Figure 5.23 The Nikon AF-S Nikkor 70–200mm f/2.8G ED VR II is sharp and versatile.

Nikon makes two versions of the 70–200mm lens: an AF-S Nikkor 70–200mm f/4G ED VR and the AF-S Nikkor 70–200mm f/2.8G ED VR II, which costs US$1,000 more. For photographers who shoot landscapes predominantly, the f/4 version of the lens is a bit smaller and lighter for those long hikes. That being said, the majority of shooters I know—landscape or otherwise—opt for the f/2.8 version. For many, that one stop of light gained and one stop of depth of field lost are worth the extra expense. Note that the f/2.8 is built like a tank and weighs as much.

Composing With Telephotos

I often find it difficult to compose well when using telephoto and super-telephoto lenses—it's simply hard to see composition at longer distances. The following are a few compositional tips to keep in mind when sizing up a long-lens frame.

Think Simplicity

Telephotos force you to think more simply about the images being made (Figure 5.24). Take a look at some of your favorite images made at long focal lengths like 200mm, 300mm, or longer. Chances are, they are not overly complex with many definable subjects, and they might even contain a bit of mystery as to the context in which they were shot. In fact, telephoto lenses force us to heavily consider what must be left out of the frame in order to bring attention to what should be in it. Simplification is a good thing to consider at all focal lengths.

ISO 200 • 1/1250 sec. • f/8 • 200mm

Figure 5.24 Instead of trying to capture the entire machine, isolating and focusing only on the bucket makes for a much simpler but more dramatic shot of this reef rebuilding machine.

Learn to isolate

Telephoto lenses are good for mitigating distraction simply because they’re too long to include everything. Decide what needs to go and what needs to stay. This is about making certain subject matter shine. Take sports photography, for example. Agencies often send photographers lists of players on which to concentrate, particularly if they are being considered for professional play. These agencies not only want action shots (**Figure 5.25**), but they also want what they call portraits (**Figure 5.26**), which are shots of the players standing or walking on the field. A long lens, such as an AF-S Nikkor 400mm f/2.8E FL VR, is perfect for excluding anyone else close to the subject of interest from the frame. Telephotos are great at blurring the background in wildlife shots as well, no matter how fast the maximum aperture may be (**Figure 5.27**).

ISO 100 • 1/1000 sec. • f/2.8 • 400mm

Figure 5.25 An isolated action shot of a football player draws attention to only the subject of interest, emphasizing his athleticism.

ISO 100 • 1/1250 sec. • f/2.8 • 400mm

Figure 5.26 A fairly standard sports portrait of a player on the field

ISO 100 • 1/250 sec. • f/5.6 • 400mm

Figure 5.27 De-cluttering an image is as simple as opening the aperture all the way. Even so, the background still contributes to the story of the image.

Because the focal plane is farther away when the subject is far away from the camera, the background remains more in focus (**Figure 5.28**). The closer the subject, the more isolating you can make the shot (**Figure 5.29**). In this case, the lens is saying, “Look at *this*!” Shots like these are fun to make, and they are extremely useful for portraiture and editorial purposes.

ISO 400 • 1/160 sec. • f/5.6 • 200mm

Figure 5.28 A cowboy walks his mount across the river a fair distance from the camera, and much of the background is in focus.

ISO 400 • 1/640 sec. • f/2.8 • 200mm

Figure 5.29 When you zoom closer, the background moves more into a visual abstraction of the environment. Yet, it is still a major part of the image's overall readability.

Pay attention to the background

Throwing a background out of focus is one of the surest ways to make a subject pop in an image, but too bright of a background can distract from a dimly lit subject (**Figure 5.30**), and can also make a subject fade into a very dark background (**Figure 5.31**). A blurred background is nothing more than light values. Either moving your own position or moving the subject against a new, nondistracting background can overcome light values that are bothersome in your shot. It's always a good idea to consider the tonal values of what is behind the subject (**Figure 5.32**).

ISO 200 • 1/200 sec. • f/4 • 300mm

Figure 5.30 **The bright canyon wall behind the cyclist overrides the eye's ability to maintain constant focus on the shadowed rider.**

ISO 200 • 1/25 sec. • f/4 • 105mm

Figure 5.31 **The subject's dark hair makes the outline of his head disappear into the black background.**

ISO 1600 • 1/160 sec. • f/4 • 105mm

Figure 5.32 The flowers in this wedding reception balanced well against a blue-lit wall thrown out of focus in the background.

Context vs. decontextualization

Consider how the strength of the bokeh (the degree to which a background is out of focus) has an effect on an image's meaning. With long lenses and wide-open apertures, it's fairly easy to isolate the subject by using extremely shallow depth of field. However, it is just as easy to delete any kind of meaningful, storytelling context the background may provide for the shot. In some cases, this is the photographer's intention. Head shots, for example, are supposed to focus on the person in them, not the background (**Figure 5.33**). These images demand the background just fade to a complementary shade of blurred color and light.

ISO 200 • 1/250 sec. • f/2.8 • 200mm

Figure 5.33 A head shot is all about the person in the frame, justifying a complete blurring of visual matter in the background.

Other shots may call for the background to play a bigger storytelling role. Tight portraits or close-ups of static subject matter may need the background to say something more than just blurred color and shapes (**Figure 5.34**). Photographers have a tendency to use the shallowest depth of field for shots like this.

ISO 100 • 1/2000 sec. • f/2.8 • 190mm

Figure 5.34 Even at f/2.8, the distance of the primary subject and secondary subject (the tower) from the camera kept the background in focus enough to tie the graduate to an iconic feature of the university.

It may be to your advantage to increase the depth of field sometimes, to draw a stronger connection between subject and the environment serving as a background. Instead of shooting at f/2.8 (**Figure 5.35**), perhaps use f/5.6 or f/8 (**Figure 5.36**). You can produce an image that is aesthetically pleasing yet not decontextualizing. You may also choose to move the subject closer to the background instead of stopping down the aperture.

ISO 100 • 1/500 sec. • f/2.8 • 150mm

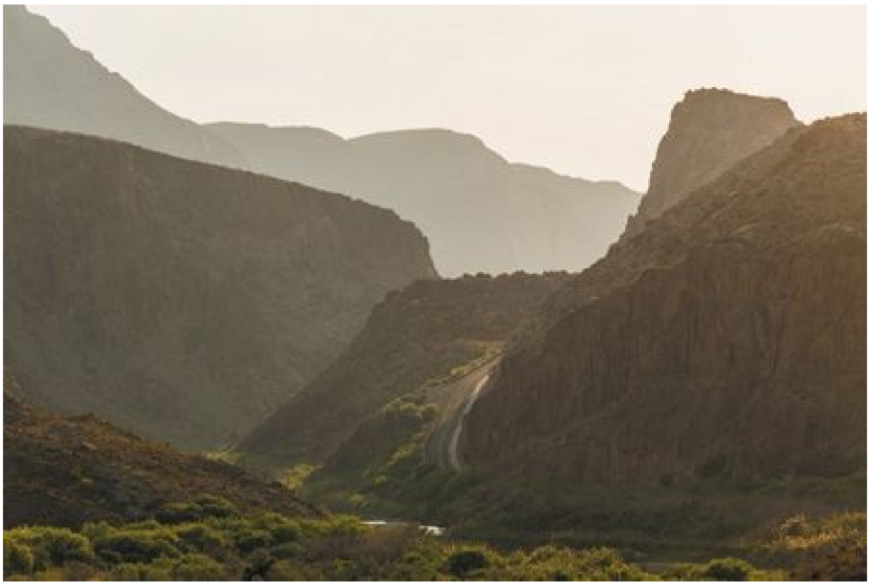
Figure 5.35 At f/2.8, the cooler stands out well, but parts of the subject—like the fly rod he is holding—get lost in the light values of the background.

ISO 100 • 1/60 sec. • f/8 • 160mm

Figure 5.36 Stopping down to f/8 brings the background more into focus, and the human subject immediately stands out against the vegetation farther back.

Compress

I described optical compression in Chapter 2, but it bears repeating that this is a visual element photographers should take advantage of when using longer focal lengths. Many of the interesting facets of the images in this chapter are a direct result of foreground and background being slammed together in varying degrees of compression (**Figure 5.37**). Learn to see how compression affects the images you want to make, helping you produce different looks for a subject. It will even help you make the most of unique atmospheric conditions, such as haze, fog, and water (**Figure 5.38**).



ISO 100 • 1/250 sec. • f/9 • 200mm

Figure 5.37 **The mountains of Texas and Mexico along the Rio Grande seem dramatically close with a long focal length's compression.**

ISO 100 • 1/800 sec. • f/6.3 • 200mm

Figure 5.38 **Certain subject matter can be made to look even more interesting with the right light and perspective, such as in this tight shot of backlit irrigation water.**

Look for Layers, Rows, and Patterns

One of my absolute favorite things to do with telephoto lenses is shoot repetition (**Figure 5.39**). I always have my eyes peeled for shapes and forms that occur in some sort of systematic fashion. I'm primarily drawn to three different visual elements that exhibit this repetition: layers, rows, and patterns.

ISO 200 • 1/400 sec. • f/4 • 82mm

Figure 5.39 Train your eye to look for repetitious subject matter, like this side of a building in New Orleans.

These elements can be found just about anywhere, such as a hayfield or the clouds in the sky (**Figure 5.40**), windows on a building (**Figure 5.41**), or a small plant outside your apartment door (**Figure 5.42**). Of course, you can make great shots of these elements at any focal length, but longer lenses let you see them in a variety of ways, and certainly in ways that can be more abstract. They allow you to compress layers and other repetitious elements, forcing the eye to immediately notice something that a viewer might not otherwise see in passing (**Figure 5.43**).

ISO 200 • 1/125 sec. • f/9 • 200mm

Figure 5.40 The layered structure and colors of the sky are made even more interesting with a compressing focal length.

ISO 100 • 1/200 sec. • f/4 • 80mm

Figure 5.41 The human eye is attracted to patterns, like this wall of windows in Madrid's Plaza Mayor.

ISO 100 • 1/10 sec. • f/8 • 90mm

Figure 5.42 A close-up shot of a fern reveals the patterned look of the plant.

ISO 100 • 1/800 sec. • f/2.8 • 400mm

Figure 5.43 Wide-angle lenses would not capture patterns like this small peloton, even if it were closer to the camera. The longer focal length's compression helps the eye discern this layering of people and form.

Repetitious shots like this can often be a mystery, and aside from the playfulness of these images, they allow the photographer to produce a sensory connection with the viewer. I often describe close-ups as those shots that make someone use their sense of touch imaginatively. Although we cannot replicate this sense with the camera, a tight shot of the patterned texture of a rocky ledge or a small succulent plant (**Figure 5.44**) can help someone imagine how that subject feels.

ISO 200 • 1/30 sec. • f/2.8 • 135mm

Figure 5.44 **Green-and-white repetition, with just enough evidence of what the subject is, makes for a great close-up.**

Longer lenses let the photographer draw the viewer's eye to a pattern as if it were more important than the content itself (**Figure 5.45**). It is another interesting way of presenting subject matter, as well as a great way to create interest in other shots of the same subject or in the same story.

ISO 200 • 1/1250 sec. • f/2.8 • 200mm

Figure 5.45 **Even though the outfielder is the primary subject of the shot, the patterned outfield makes the shot even more interesting.**

Choosing Telephoto Lenses Wisely

Telephoto lenses are expensive, more so than most other lenses, and especially so when you get to the real big fellas: the 400mm, 500mm, 600mm, and 800mm. As with all lenses, spend some time comparing features before purchasing, and remember, the longer the lens, the more specialized it becomes.

First, consider what it is you want to shoot with the telephoto, and more important, how frequently will you be shooting similar subject matter? If you are shooting mostly portraits, 200mm might be the longest lens you consider. There are several great lenses that include 200mm in their zoom range as well as prime lenses leading up to 200mm. If you are shooting sports, consider your 300mm and 400mm options. I can't speak highly enough of the 400mm platform for football, baseball, and any sport that doesn't happen mere feet in front of you. For basketball, however, you can get away with a 70–200mm lens.

The second consideration is how much weight you are willing to lug around. Some telephotos can be fairly lightweight, like the AF-S VR Micro-Nikkor 105mm f/2.8G IF-ED and the AF-S DX Nikkor 18–300mm f/3.5–6.3G ED VR. When you start getting into the telephoto lenses that have a wide maximum aperture, the weight goes up dramatically, caused by the size of the maximum aperture (the amount of glass in each lens), Vibration Reduction, and appendages like tripod mount collars. For most folks, the weight of the lens does not matter until the 300mm focal length, but even carrying around an AF-S Nikkor 70–200mm f/2.8G ED VR II might cause some backache. I favor carrying either the AF-S Nikkor 300mm f/4D IF-ED or the AF-S Nikkor 80–400mm f/4.5–5.6G ED VR over the f/2.8 versions when I am out hiking strenuous landscapes—they are several pounds lighter and easier to pack in one bag.

The last thing to consider is the lens's price points. Nikon's long lenses range in price from US$600 (for the AF-S Zoom-Nikkor 70–300mm f/4.5–5.6G IF-ED) to US$17,900 (for the AF-S Nikkor 800mm f/5.6E FL ED VR). Going into debt over a lens that you may pull out of the bag a couple times a year—or will never use to make money—would not be wise. If you're not a bird photographer, don't even look at the 600mm or 800mm lenses. When I need to photograph birds, I determine whether or not I can use my 400mm. And, if I can't, I rent. However, I do use my 70–200mm lens every time I go on a shoot. With that, I can justify investing in the higher-priced, higher-quality version. Ultimately, the decision to purchase a lens is up to you.

Practice, Practice, Practice

To get acquainted with any of your lenses, practice is key. The longer and heavier the lens, the more time you need with it. This might mean taking regular walks or excursions with your camera. Here are a few things to work on and consider when mastering the long lens.

Minimum Sustaining Shutter Speed

In the first chapter, I covered minimum sustaining shutter speed—the slowest shutter speed you can use while handholding a camera and lens to achieve a sharp shot. Any slower shutter speed will result in a body-caused motion blur. Knowing your personal minimum sustaining shutter speed with every lens, especially telephotos, comes in handy (**Figures 5.46** and **5.47**).

ISO 100 • 1/50 sec. • f/2.8 • 165mm

Figure 5.46 This portrait is slightly out of focus, a result of shooting such a long focal length at a relatively slow shutter speed.

ISO 100 • 1/80 sec. • f/2.8 • 150mm

Figure 5.47 Using a bit shorter focal length and moving in close, I was able to sustain the focus of the portrait at just a notch faster shutter speed.

The surest way to find this out is to simply put a camera to your eye with your long lens on and make exposures with slower shutter speeds each time you snap a shot. Look at the shutter speed on the last shot in focus, and you'll know your minimum sustaining shutter speed for that lens. If you are new to photography, this shutter speed will more than likely have a denominator that is close in numerical value to the focal length you used.

For example, if you are shooting with a 200mm lens, the theoretical minimum sustaining shutter speed would be 1/200 of a second. The idea is to shoot at that shutter speed or faster to avoid your body movement forcing a shot out of focus. The longer the lens, the faster the minimum sustaining shutter speed becomes.

Of course, with practice, any photographer can reduce the minimum sustaining shutter speed for any lens. Using the lens enough to be familiar with how it handles is one way. The other way is through increased stability.

Finding Stability

Reducing your minimum sustaining shutter speed is all about finding and increasing your stability. The sturdier you make your camera and lens, the more able you are to handhold them while still retaining focus.

The stance

Here's a sure-fire way to immediately add stability to your shooting: Put your left hand *under* the lens, and lock your elbows onto the side of your body (possibly on the top of your hips) to provide support (**Figure 5.48**). Widen your feet, placing one in front of the other, and you've just made yourself a much more stable human platform. Let your own weight settle before shooting, and press the shutter button when you exhale (you may not be able to do this when shooting things in flight or extreme motion). All of this is about tuning your body to reduce the minimum sustaining shutter speed and ensure sharp images. Again, this technique is not exclusive to telephoto lenses, but it really starts to make a mark here.

Figure 5.48 A stable stance: Place the lens on top of your left hand, lock both elbows into your body, and widen the position of your feet, one in front of the other.

Adding weight

Heavier lenses are often more stable to handhold than the featherweight alternatives, especially if your stance is set well. Many folks would say that the AF-S Nikkor 300mm f/4D IF-ED is more stable than a more-flexible AF-S VR Zoom-Nikkor 70–300mm f/4.5–5.6G IF-ED. Why? The prime lens has a bit more heft to keep it from bobbing around with the movement of the supporting arm and hand. It makes sense that adding weight (to a point) makes a platform more stable.

So, what if you own a telephoto lens that seems to jump around with the slightest movement of your hand or body? I have seen photographers tape small weights to their longer lenses. I even know one wildlife photographer who wraps one-pound ankle weights around the circumference of his AF-S 400mm f/2.8 with camouflage tape. You probably can't put ankle weights around every telephoto zoom, and some lenses do not have enough room on the barrel for large weights, but there's always a creative way to add more weight. There are no rules about how much weight to add. It is simply worth experimenting if you experience more than normal movement of the lens when you are shooting.

Tripods

There are times when the human platform is just not stable enough. Once you pass under the minimum sustaining shutter speed, it is time to put the camera and lens on a tripod. Here are a few tips to make the most out of stabilizing your tripod.

If you have a lens that has a tripod mount collar, use it (**Figure 5.49**). Lenses that have these, such as the AF-S Nikkor 70–200mm f/2.8G ED VR II, the AF-S Nikkor 300mm f/4D IF-ED, and the AF-S Nikkor 400mm f/2.8G ED VR, are simply too heavy for the tripod to be connected to the camera. If the lens doesn't break off the camera, the weight of the lens may tip the tripod over, or more likely, the instability of this kind of setup will rock the camera and lens up and down while you are trying to make a steady shot. If your lens did not come with a tripod mount collar or have room for one, it probably doesn't weigh enough to cause this issue. Set the tripod legs apart as far as they will go at the height you have the tripod. The closer the legs are together for any height, the more likely the rig will tip over. Add the weight of any telephoto lens on top, and it will tip more quickly.

Figure 5.49 Using a tripod mount collar helps better balance the weight distribution of the camera and lens, resulting in less wobble and cleaner images. Here you can see the lens is attached to the tripod, not the camera.

Add weight to the tripod. Many tripods have hooks at the bottom of the center column. Hang your camera bag from this to further stabilize the platform (**Figure 5.50**). If you don’t have a bag or anything that can hang from this hook, use your body to add weight. Make sure your tripod legs are secure and will not slip, and while you are shooting, hold onto one of the legs, adding a bit of your own weight for stability. This works for fairly quick shutter speeds, but I wouldn’t trust your body for stability if your exposure is longer than, say, a second or two.

Figure 5.50 **Hanging a bag from the middle column of a tripod is a great way to add weight for stability.**

Also consider carbon. Carbon tripods are not heavy (quite the opposite), but they have one thing going for them in terms of stability that aluminum tripods don’t: Carbon legs translate less vibration than aluminum legs. There have been times when I became frustrated with my aluminum tripod in a river because I could feel the water moving by the tripod legs. The vibrations were stronger the closer I got to rapids. Carbon legs are helpful in these situations, and you can always add more weight. Carbon sticks are more expensive than aluminum sticks, but there are some great companies making affordable carbon gear. I use both aluminum and carbon tripods, with Manfrotto being my go-to for aluminum sticks. They also have relatively affordable carbon alternatives to some of their most popular aluminum tripods.

Monopods

Let’s be honest here. Tripods can sometimes be a royal pain to lug around. Sometimes shooting doesn’t call for that much baggage and it needs to happen much quicker than setting up a tripod allows. Enter the monopod. With only one column of support, the monopod is more like an extension of your hand and arm, just more stable. Monopods really come in handy when you need to carry around a long lens for a long time—like an entire college football game—and avoid fatigue on the human platform. Certainly, they come in handy when the minimum sustaining shutter speed is breached, but their real purpose is for the long haul. We can certainly handhold a few shots with a big AF-S 500mm f/4, but we would get real tired of holding it up.

Some folks like to use a monopod in place of a tripod. Make no mistake, they serve two different purposes, and they are not necessarily interchangeable. A tripod, in my opinion, is a photographic necessity. A monopod is necessary in certain types of photography (like sports and some wildlife) when the purpose of using one—endurance and efficiency—is paramount.

Chapter 5 Assignments

Telephoto focal lengths take the most effort to use effectively. It is not all about simply zooming into the action. They are also a bit touchy to handhold. Work through the following assignments to help you with both seeing through a telephoto lens and shooting without a monopod or tripod.

Go long!

Like I did in Chapter 3, I encourage you to take a photo walk with only one focal length. This time, rack your lens out to 200mm (if you have a lens that goes to 135mm instead, lock it there). This is a nice standard telephoto focal length that will force you to see the world around you in terms of compression and composition at a distance. Make images only at this focal length to become comfortable with the lens as well as to become more capable of previsualizing images at this focal length. If you have a zoom lens, it might be easy to just zoom in and out depending on your composition, but I encourage you to leave it where you started to train your eye. If you would like, take another photo walk using only 300mm, and another with 400mm if you have it. Unless you’re using telephoto focal lengths all of the time, it is difficult to see or imagine the shots you can make with them. This exercise, although simplistic, helps do just that.

Pick out patterns

While on that photo walk discussed above, look for repetitive patterns, rows, and layers to tighten in on and create images that attract the eye but do not necessarily give away the subject outright. If you are downtown, concentrate on the sides of buildings, windows that are lit well or reflect an interesting sky, manhole covers, or layers of people walking during rush hour. If in the wilderness, consider layers of plant leaves, trunks of trees, or boulders in a stream, and always be cognizant of the cloud structure in the sky.

Practice tracking

One of the hardest techniques to do without practicing is tracking a moving subject with a long lens, especially if said subject is moving fast. Work with another person—perhaps a runner or cyclist—and practice tracking her movement with a telephoto focal length of at least 200mm (go longer for a more challenging exercise). Switch the autofocus mode on the camera to one that constantly engages the autofocus system for movement (continuous autofocus). Have your subject move across your field of vision as well as toward and away from you at angles. Practice handholding the lens while you make shots of her, keeping only one autofocus point locked on her as much as possible. The closer the subject matter, the more challenging tracking becomes.

Share your results with the book's Flickr group!
Join the group here: www.flickr.com/groups/nikonlenses_fromsnapshotstogreatshots

6. Specialty Lenses

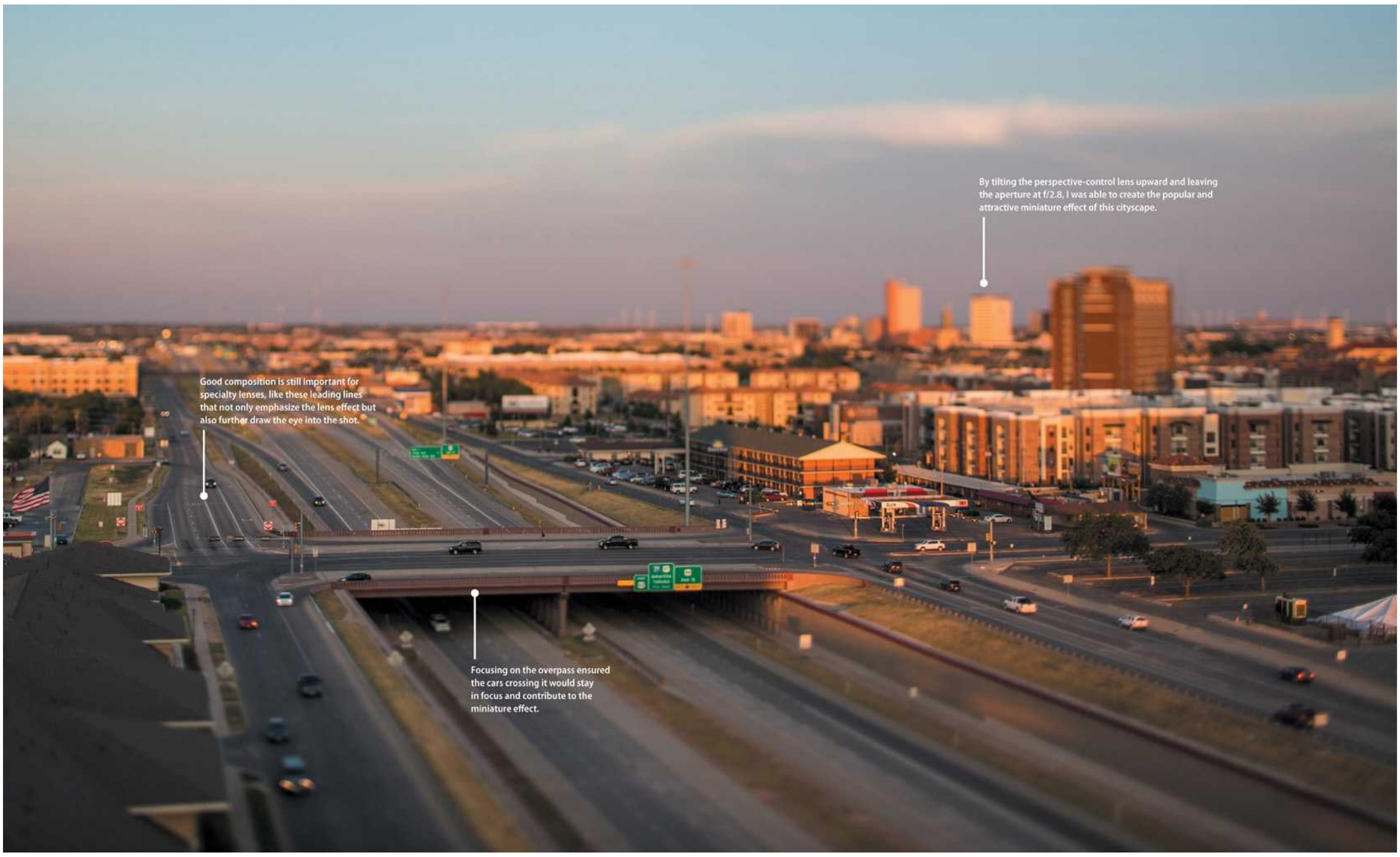
ISO 800 • 1/200 sec. • f/10 • 105mm

Close-ups (macros) and perspective control

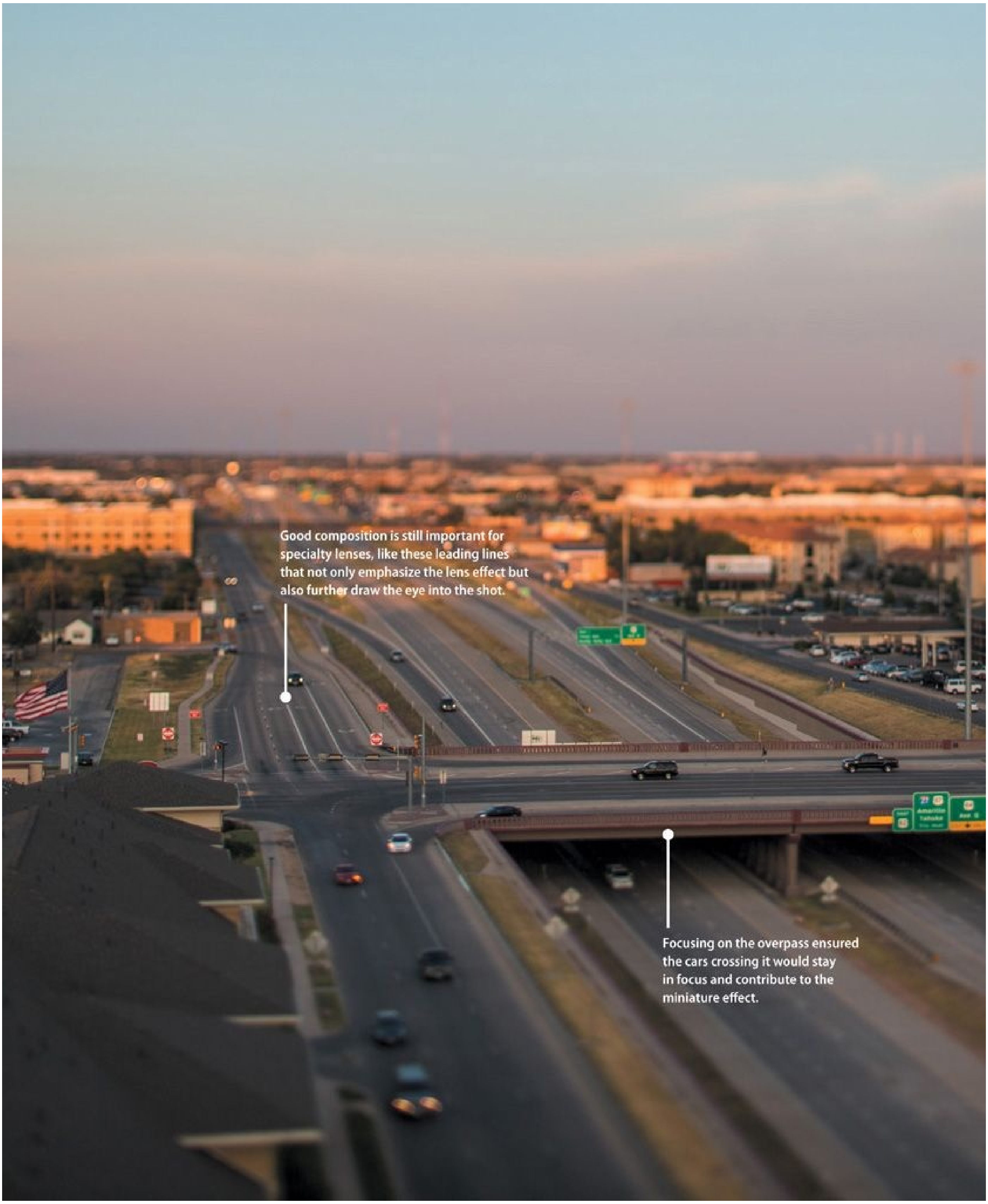
I don’t often practice macro photography (which requires a lens that is essentially a low-powered microscope), but for two consecutive weeks each year I lead a photography field course in a diverse area of Texas rich in greenery and natural color. During that time, shooting the expanse of flowers is just not enough. I also need to get low and close to my subject matter—so close that a trusty telephoto lens is useless due to its long minimum focusing distance. To get extremely close, I need a dedicated close-up (Nikon’s name for macro) lens, designed to have a short minimum focusing distance, allowing me to push close enough in on a flower that I can count the veins in the petals. Every spring, I’m thankful that these lenses are available.

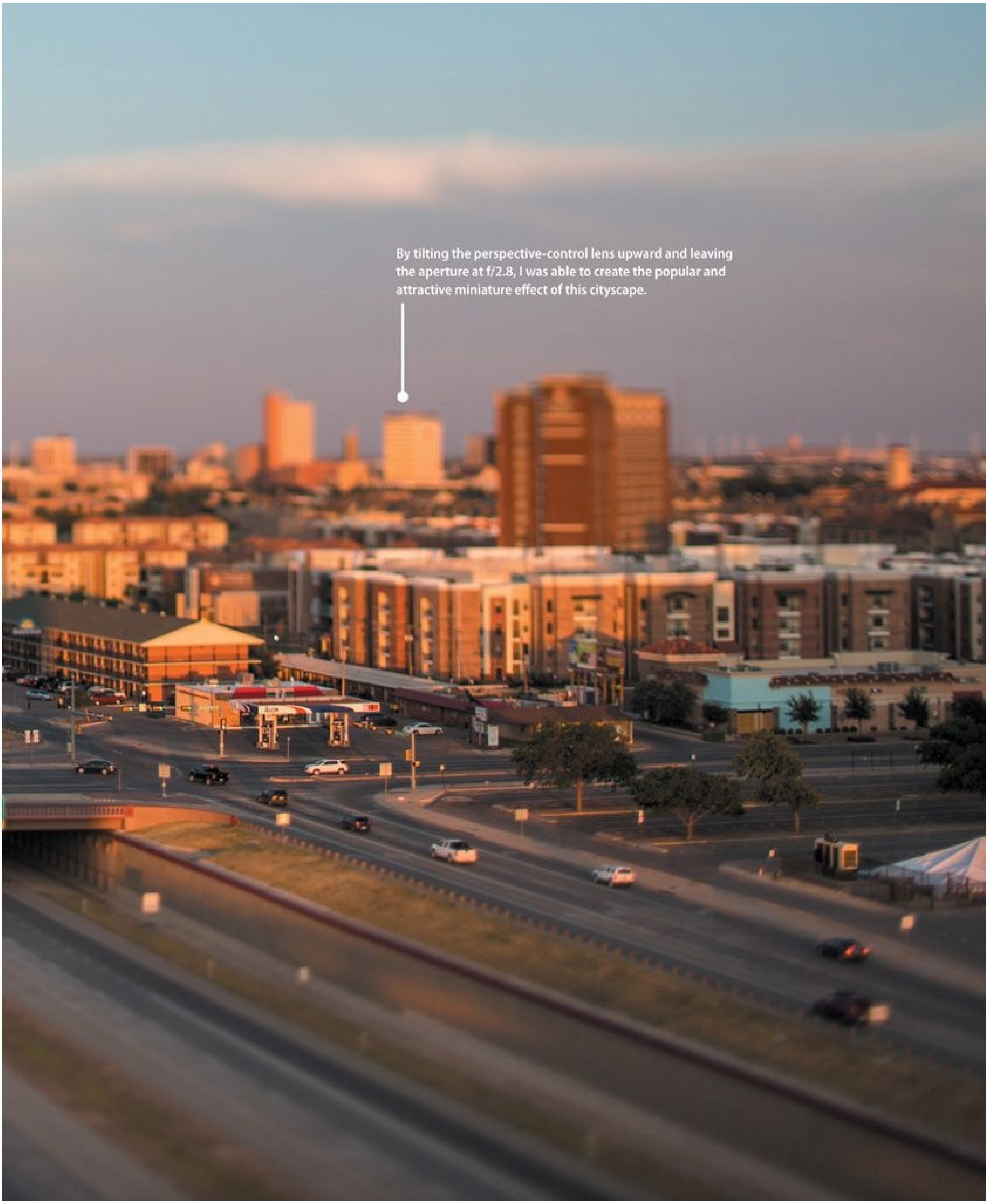
Every lens could be considered a specialty lens. Each has its typical area of use—wide-angles for landscapes, medium telephotos for portraits, super telephotos for wildlife, and so on. However, Nikon manufactures some lenses that fit within the previous designations but are also capable of much more. Enter close-up and perspective-control lenses, two different types of lenses with two very different and creative functions.

Poring Over the Picture



ISO 100 • 1/400 sec. • f/2.8 • 45mm


Good composition is still important for specialty lenses, like these leading lines that not only emphasize the lens effect but also further draw the eye into the shot.
Focusing on the overpass ensured the cars crossing it would stay in focus and contribute to the miniature effect.



By tilting the perspective-control lens upward and leaving the aperture at f/2.8, I was able to create the popular and attractive miniature effect of this cityscape.

Close-up (Macro) Lenses

“Macro” is not usually associated with “small.” However, in the case of photography, close-up lenses are what it takes to shoot the ultimate macros. I’m a sucker for great flower photography, and in order to capture the delicate nature of the flower’s structure, the minimum focusing distance—the closest one can focus on a subject—of many lenses is simply too long. That’s not to say you can’t crop an image to make it a closer shot of the subject, but then you sacrifice printability and image real estate. Some folks also use their telephotos to zoom in tight on a subject, but this risks motion blur and a lower level of compositional control. A close-up lens is just the thing to get in close on a subject without sacrificing quality and aesthetics.

The Lineup

Close-up lenses are built with short minimum focusing distances for their overall focal length. Nikon makes ten dedicated close-up lenses:

- AF-S DX Micro-Nikkor 40mm f/2.8G
- PC-E Micro-Nikkor 45mm f/2.8D ED
- Micro-Nikkor 55mm f/2.8
- AF Micro-Nikkor 60mm f/2.8D
- AF-S Micro-Nikkor 60mm f/2.8G ED
- PC-E Micro-Nikkor 85mm f/2.8D
- AF-S DX Micro-Nikkor 85mm f/3.5G ED VR
- Micro-Nikkor 105mm f/2.8
- AF-S VR Micro-Nikkor 105mm f/2.8G IF-ED (**Figure 6.1**)

Figure 6.1 My personal favorite close-up lens is the AF-S VR Micro-Nikkor 105mm f/2.8G IF-ED.

- AF Micro-Nikkor 200mm f/4D IF-ED

The longest lens in the lot, the AF Micro-Nikkor 200mm f/4D IF-ED can focus as close as 1.6 feet away from the subject, with the other lenses able to focus even closer. Don’t think that sounds impressive? The closest focusing distance of an AF-S Nikkor 70–200mm f/2.8G ED VR II is 4.6 feet.

Thinking Smaller

The first time you use a close-up lens is fun, letting you see a very different, almost magical world our eyes cannot see. However, making nice images with close-up lenses can be daunting. In many cases, it forces photographers to explore the frame and its content in a very different way than they would a wider, backed-out shot of a larger context, such as a landscape.

We have to put ourselves into the macro mindset. This means instead of looking at a large area for composition, you look for it in several square inches of space, or less! Macro photography requires a great deal of patience. Folks who consider themselves macro photographers can spend an hour in a spot no larger than a sedan if it is rife with subject matter. Working on a much closer scale amplifies both the subject and the precise technique required (covered later in the chapter). Macro work can often be therapeutic, especially outdoors with the right light.

Light

As with other areas of photography, where the lens is pointed in relationship to the direction of light hitting the subject is of great importance. Light from over the shoulder (**Figure 6.2**) is not as dramatic as light coming from the side (**Figure 6.3**) or behind the subject. In fact, front light can sometimes be downright boring for macro work.

ISO 100 • 1/60 sec. • f/4 • 105mm

Figure 6.2 Soft front lighting does little to produce dramatic shadows since they are mostly behind the subjects of interest.

ISO 50 • 1/200 sec. • f/4 • 105mm

Figure 6.3 Shooting the same subject with artificial light hitting it from slightly off-axis increases the visual intensity of the shot and makes the flower appear more dramatic.

Diffused light is the softest, most relieving type of light for natural subject matter like flowers (**Figure 6.4**). When I'm in a park, my ideal day for photography includes strong, dramatic light in the early morning and late evening, and overcast skies in between. In overcast conditions, sunlight is dispersed in all directions as it exits the clouds toward Earth, dissipating any strong shadows on subjects of interest.

ISO 400 • 1/160 sec. • f/5.6 • 105mm

Figure 6.4 Diffused light, like that produced by overcast skies, reveals great color and detail for close-up shots.

Ultimately, light will react the same way on a smaller scale as it does on a larger one. Working the light in macro photography just means you have to adjust your idea of what large and small lights do for a particular subject. While a relatively large light source, such as a floor-to-ceiling window, may provide soft shadows for a portrait, the same light source used with something much smaller can completely remove shadow.

Composing with close-up lenses

You need patience when composing with close-up lenses. You cannot just walk up to a macro subject, quickly compose, and fire off a shot. It takes time and minute adjustments to the placement of the lens in order to find just the right composition. Principles like the rule of thirds still have their value, but macro shots often involve one subject that really stands out, so your composition will revolve around that primary point.

I usually consider design when I'm composing, especially with macro images. Since I shoot quite a bit for magazines, I want shots to engage a viewer with great leading lines (even if they are part of the shot's bokeh), to have visual real estate so the eyes move freely around, and allow for a designer to use that space (**Figure 6.5**). For many of my macro shots, the depth of field is very shallow, and the bokeh is a void space that counterbalances the subject. I want such a space to complement the subject instead of provide another visual attraction (**Figure 6.6**). Taking the time to find this balance of void versus content is valuable. I love close-up shots where the visual direction of the image is pushed primarily by out-of-focus nothingness!

ISO 200 • 1/800 sec. • f/3.2 • 105mm

Figure 6.5 Because a large area to the right of the trumpet vine flower is out of focus, a magazine designer can include type for a story about these vibrant plants.

ISO 200 • 1/800 sec. • f/3.2 • 105mm

Figure 6.6 There's not much other than the main subject to draw the eye compositionally in this shot of a trumpet vine bud except for a background that provides context instead of distraction.

Also consider the angle at which the lens is pointed at a subject. My first hundred or so macro shots of flowers were from straight above, splays of colorful petals. I would move in on one flower, throw the background completely out of focus with a large aperture, and shoot. Great, right? For some shots, yes (**Figure 6.7**). There are fantastic ways of composing shots like this, with one flower taking up most of the frame and a couple more reaching into the image.

ISO 200 • 1/320 sec. • f/3.5 • 105mm

Figure 6.7 Shooting straight down on macro subject matter works, but it can result in a less-than-dynamic visual, such as this flower that seems to be floating on top of a bed of green.

For other shots, shooting straight down on a subject like this can result in images lacking dimension and personality. One way to resolve this is to simply angle the lens—and in doing so, the plane of critical focus—away from being parallel to the subject. Even if you are shooting with very shallow depth of field, angling the lens just the slightest adds visual depth to macro shots. In fact, a very soft bokeh is sometimes necessary to stress this depth. For flowers, I like to use the stem as a strong leading line to the main subject matter, the petals (**Figure 6.8**). You can only find the flower's stem by angling the lens. The stem will more than likely be out of focus, but it will appear as if it is emerging from far below to bring a colorful gift (**Figure 6.9**).

ISO 200 • 1/320 sec. • f/3.5 • 105mm

Figure 6.8 Moving the lens to where it is at a more extreme angle to the flower reveals the stem as a leading line to the primary subject.

ISO 200 • 1/320 sec. • f/5.6 • 105mm

Figure 6.9 Stems and other leading lines do not necessarily need to be in focus for them to draw the eye.

Depth of field and shutter speed

Something you should know about depth of field with macro images: It's a bit more shallow than you think. Relative to the focal length and its close-up capability, the selected aperture setting will provide you the proper amount of depth of field, but since the area being photographed is much smaller and the lens is much closer to the subject, the depth of field seems much more shallow than if the shot was a portrait from ten feet away (**Figure 6.10**).

ISO 800 • 1/200 sec. • f/10 • 105mm

Figure 6.10 I shot the diamond-plate panel of a guitar amplifier straight on using an aperture of f/10 to ensure the small rises of the metal would be in focus as well.

Why is this worth talking about? For one, at extremely shallow depth of field, any movement of the camera and/or subject will knock the image out of focus. Even if the shutter speed is fast enough for both types of movement, the subject can easily be moved away from the focal plane and the shallow depth of field. This is true for all lenses with fast apertures, but it is amplified at macro distances (**Figure 6.11**). If you encounter this issue, consider stopping the aperture down a full stop, or maybe more (**Figure 6.12**). The effect on the soft bokeh behind and in front of the subject will be minimal, and the smallest parts of the subject that were out of focus will become clear with the depth-of-field expansion.

ISO 200 • 1/320 sec. • f/3.3 • 105mm

Figure 6.11 **Using a maximum aperture on some macro subjects shot at an angle, like this YETI bottle opener, may not provide the necessary depth of field for strong subject identification.**

ISO 200 • 1/125 sec. • f/5.6 • 105mm

Figure 6.12 **Increasing the aperture to f/5.6 brings more of the logo into focus and causes less strain on the eye while also offering an aesthetically interesting look.**

It is also wise to work with a tripod when shooting macro. A tripod might feel like it slows you down, but it will mitigate the amount of movement in your shot. It will also keep you from creating a blurry shot from using too slow a shutter speed. Like super-telephoto lenses, close-up lenses—when pushed in extremely close to the subject—are essentially telescopes to handhold steadily on a subject. What might be a fast-enough minimum shutter speed to shoot a portrait will more than likely be too slow for a macro shot. Use a tripod or try to shoot with at least a one-stop-faster shutter speed and save yourself frustration at the computer later. If you’re using a tripod, be sure to use a shutter-release cable.

If I Had to Choose: AF-S VR Micro-Nikkor 105mm f/2.8G IF-ED

I have used several close-up lenses, but the one that takes the cake for me is the AF-S VR Micro-Nikkor 105mm f/2.8G IF-ED. Simply put, it is a great focal length for macro work. The lens is sharp as a tack and extremely light for the focal length and maximum aperture. The lens construction is hardy, yet it is much lighter than its longer counterpart, the AF Micro-Nikkor 200mm f/4D IF-ED. It also incorporates Vibration Reduction technology, which compensates for a great deal of movement caused by the photographer during exposure. It is quite easy to handhold this lens, even when you are shooting close to a subject.

The downside? This lens does not come with a tripod collar. A tripod collar would allow the weight of both the camera and the lens to be mounted in a more central location to the tripod. The AF-S VR Micro-Nikkor 105mm f/2.8G IF-ED is also expensive (albeit much less so than the 200mm). Regardless, it’s a great value. For someone wanting to get into macro photography while also wanting a versatile lens (also great for portraits), this is the one I recommend.

Perspective-Control Lenses

Most people will never use a perspective-control lens, not even most professional photographers. Why? For one, they just look complicated (**Figure 6.13**), what with all the knobs and the strange-looking barrel construction. Two, they *are* kind of complicated—at least at first. There’s a learned technical and creative approach to using them. Three, they are very specialized. Sure, you can use any of Nikon’s three perspective-control lenses as prime lenses, but you don’t buy or rent them for that. Most people use them for, well, controlling perspective, and in doing so, create a unique look in their images (some smartphone apps mimic this look in their presets). The fourth reason: They’re pricey, the cheapest being just shy of US$2,000.

Figure 6.13 It is easy to avoid or be intimidated by perspective-control lenses, like this PC-E Micro-Nikkor 85mm f/2.8D, with its strange knobs and absence of autofocus!

Why even have a section on these lenses when the majority of this book's readers may never use them? This type of lens serves a purpose for a number of us, and offers a creative outlet for others. Traditional landscape, commercial architecture, food, and portrait photographers use perspective-control lenses in many ways. And the lenses are easy to rent (this is what I do).

How Perspective-Control Lenses Work

All three Nikon perspective-control lenses—the PC-E Nikkor 24mm f/3.5D ED, the PC-E Micro-Nikkor 45mm f/2.8D ED, and the PC-E Micro-Nikkor 85mm f/2.8D—are about control over perspective and depth. They are constructed in a way that the user can manipulate not only a lens's focus but also the angle of the focal plane and the position of the lens's optics parallel to the camera's sensor. Sound confusing yet? Let's break down the lens's technological capabilities.

Shift

The Shift function of the lens allows the user to move the optics of the lens up/down or left/right while keeping them parallel to the camera's sensor. When you turn the Shift knob, marked by an S (**Figure 6.14**), you will notice the bulk of the lens move, or shift, parallel to the camera itself. Shifting vertically (up or down) is a great way to correct for optical distortion, particularly the wide-angle variety (**Figures 6.15** and **6.16**).

Figure 6.14 The Shift function offers maneuverability to correct for optical distortion, usually made more dramatic by wide-angle focal lengths.

Figure 6.15 **An unshifted PC-E Nikkor 24mm f/3.5D ED is set to shoot vertically on a tall subject.**

Figure 6.16 **Shifting a perspective-control lens moves the entire lens up/down (or right/left) parallel to the camera's sensor.**

Keystoning, an issue we discussed in Chapter 3, can be corrected using the Shift function

(**Figures 6.17** and **6.18**). For example, when you have to point a wide focal length (let's say 24mm) upward to photograph something very tall, like a building, the vertical lines of everything in the shot begin to converge toward the middle of the frame. Keystoning might be tolerated in many areas of photography, but in commercial or architectural photography, it is a faux pas. Enter the perspective-control lens.

ISO 100 • 1/100 sec. • f/11 • 24mm

Figure 6.17 Shooting upward on a building at 24mm will result in dramatic keystoning, where the vertical lines of the subject angle inward toward an optical center. For many photographers, this is an issue worth fixing.

ISO 100 • 1/100 sec. • f/11 • 24mm

Figure 6.18 Simply shifting the lens up after leveling the camera to the subject straightens out the walls of the building and corrects the distortion.

To correct for keystoning (**Figure 6.19**), place the lens on a tripod (tripods work well for these types of lenses) and with the subject of interest composed where you want it, level your camera out. Level it vertically and horizontally. What happened? More than likely, the horizon is in the middle of the frame, and the building's top is cut off (**Figure 6.20**). Not to worry. Using the Shift knob, shift the lens up vertically until the top of the building is where you want it in the frame (**Figure 6.21**). Turn on your camera's Live View to help you see this in action. As a result of shifting the perspective of the lens's optics, you are able to keep vertical lines straight while still working at wide (and all) angles. Likewise, you can also operate this lens vertically by the simple flick of a small locking switch near the lens mount, on the right side of a perspective-control lens.

ISO 100 • 1/400 sec. • f/8 • 24mm

Figure 6.19 Keystoning appears in all vertical lines in the frame, even the structure of the windmill itself.

ISO 100 • 1/400 sec. • f/8 • 24mm

Figure 6.20 The first step in correcting keystoning with a perspective-control lens is to level the camera to the point that all vertical lines are parallel with the vertical sides of the image frame.

ISO 100 • 1/400 sec. • f/8 • 24mm

Figure 6.21 After you level the camera, a simple shift up will lower the horizon and bring the subject completely in the frame as well as maintain the straight vertical lines.

Tilt

The Tilt function of the lens lets the user take control over the focal plane. Normally, the focal plane is parallel to the camera's sensor, just like the lens's optics. The Tilt mechanism allows the user to swing the focal plane, on a horizontal or vertical axis, away from being parallel.

This function can be used to obtain extreme depth of field in cases where f/22 is not enough or when such a small aperture slows the shutter down too much. When you tilt the lens downward—using the knob marked T (**Figure 6.22**)—the focal plane, and the subsequent depth of field, are laid over the frame instead of moving into the frame (**Figures 6.23** and **6.24**). This means that the infinite theoretical plane that makes up the plane of critical focus can now be simply placed on top of the content in the shot, and you can use a larger aperture to obtain maximum depth of field. This is more complicated than shifting a lens, but the technique is now easier than ever with digital cameras. Turn on Live View again to aid in seeing what happens when you tilt the lens down or up and then stop the aperture open or down.

Figure 6.22 **The Tilt function of perspective-control lenses allows the user to swing the focal plane horizontally or vertically, making for some interesting manipulations of an image.**

ISO 100 • 1/100 sec. • f/11 • 24mm

Figure 6.23 At f/11 and with the plane of critical focus placed on the top of the rock in the foreground, there is not enough depth of field to pull the hillside into focus.

ISO 100 • 1/100 sec. • f/11 • 24mm

Figure 6.24 When you tilt the focal plane downward ever so slightly, f/11 pulls everything into focus, from foreground to background.

To obtain maximum depth of field after tilting the lens on the subject, start with a middle aperture, maybe around f/8. Theoretically, with the focal plane tilted onto the subject, a middle aperture value will provide you enough depth of field to ensure everything is in focus. If you do not see it as so, stop down the aperture more and/or tilt the lens onto the subject more.

If I Had to Choose: PC-E Micro-Nikkor 45mm f/2.8D ED

I don’t own any perspective-control lenses simply because I don’t use them enough to justify the expense (I rent instead), but if I were to go out and buy one today, it would be the PC-E Micro-Nikkor 45mm f/2.8D ED.

The PC-E Micro-Nikkor 45mm f/2.8D ED is sharp, built like a tank but fairly lightweight for a perspective-control lens, and it is versatile. It is a great lens for architecture as well as a nice lens for shooting panoramas and portraits. It even has macro photography functionality. What more could you want? It is a well-built piece of gear, and the f/2.8 maximum aperture works well for night photography and handheld shots. It also doubles as a prime lens that is close to sporting normal perspective. The lens is great for just about any type of photography (bearing in mind that the lens requires manual focus). If I photographed food more often, I might consider the PC-E Micro-Nikkor 85mm f/2.8D, but my money is on the PC-E Micro-Nikkor 45mm f/2.8D ED for the broad spectrum to which it applies.

You can use the Tilt function to maximize focus into an area of the frame without adding depth of field. This works especially well when you are photographing a row of similar objects that are not parallel to the camera. Leaving the aperture fairly open and the lens untilted, depth of field falls off just like it normally would with any lens (**Figures 6.25** and **6.26**). However, you can tilt the focal plane horizontally (or vertically, depending on your original orientation) to where it lines up with the row of subjects. The result is a row of subject matter that is in focus but with areas outside the row blurred (**Figures 6.27** and **6.28**). This is a popular technique for commercial-product photographers.

Figure 6.25 Left "zeroed" out, a perspective-control lens, such as this PC-E Micro-Nikkor 45mm f/2.8D ED, will act just like any prime lens.

ISO 100 • 1/800 sec. • f/4 • 45mm

Figure 6.26 **The depth-of-field drop-off is the result of the focal plane being parallel to the camera's sensor; the out-of-focus area starts directly after the tree on which the focus is placed.**

Figure 6.27 **Tilting the lens swings the focal plane so it is diagonal to the camera's sensor.**

ISO 100 • 1/800 sec. • f/4 • 45mm

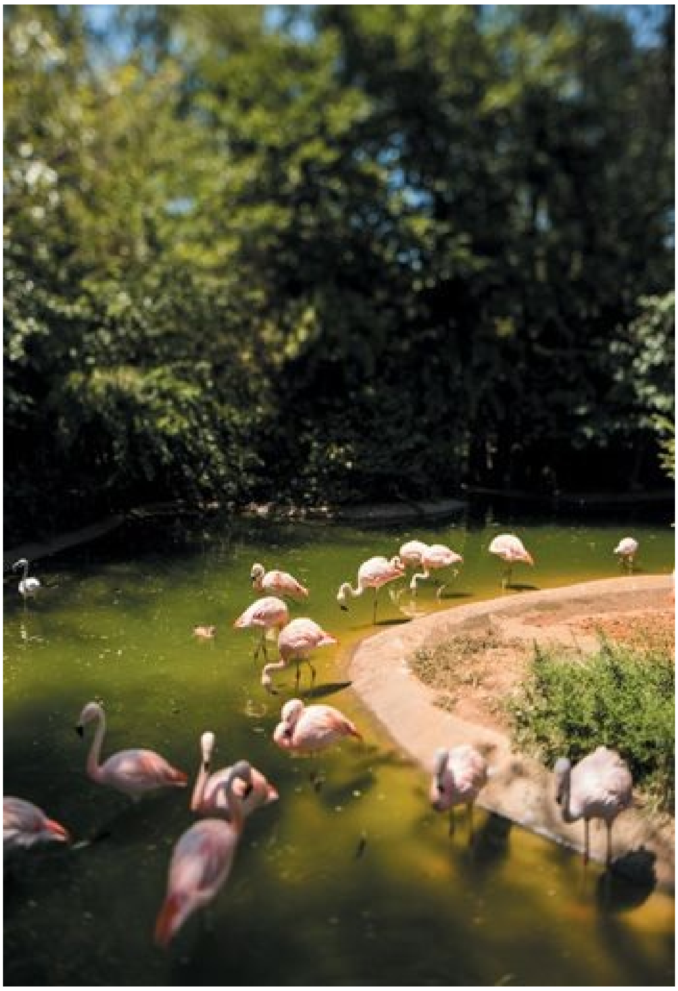
Figure 6.28 The lens is tilted enough to place the focal plane along the row of trees, but the fairly open aperture keeps the depth of field that extends from that plane to a minimum.

Perspective Control Creative Applications

Perspective-control lenses offer similar capabilities to those of old view cameras (still used by some photographers). The accordion-like construction of view cameras lets the user shift and tilt the optics at the front of the camera easily. This not only enables you to control perspective and optical issues, but it also allows for quite a bit of creative flexibility. With modern-day perspective-control lenses, these creative applications are put into practice with the Tilt function.

The miniature effect

One of the most popular looks in the past decade, the miniature effect has done quite a bit to bring perspective-control lenses into the mainstream (**Figure 6.29**). Simply put, perspective-control lenses can be used to make an otherwise normal-looking world seem as though it was a toy. This is a fun and interesting way to showcase an environment as well as a unique way to grab the viewer's eyes.



ISO 100 • 1/640 sec. • f/3.5 • 24mm

Figure 6.29 Tilting a perspective-control lens upward while using shallow depth of field can quickly create a miniature effect. The effect is exaggerated when there are many similar subjects within the frame.

Invoking the miniature effect is quite simple. Find a worthy looking land- or cityscape, and find a place where you can position yourself a bit higher than ground level. A bridge, hill, or ladder will work. Once you are in position, you can choose to shoot vertically or horizontally (**Figure 6.30**).

ISO 100 • 1/2000 sec. • f/3.5 • 45mm

Figure 6.30 This is an untilted (normal) look down a freeway.

Get the miniature effect in three steps: (1) Point the lens down while composing the shot. (2) Tilt the lens upward, away from the relative position of the subject matter in your shot. (3) Use a large aperture, such as f/2.8 or f/4. As a result, the only thing(s) in focus will be content through which the focal plane passes, and everything below and above the plane will go out of focus (**Figure 6.31**). This special tilt of the optics is synonymous with the miniature effect. Remember, though, that if you increase the aperture too much, you will quickly increase depth of field. The miniature effect relies on shallow depth of field. Use cars, planes, and other modes of transportation (or people) in your shot to help convey the toy look.

ISO 100 • 1/2000 sec. • f/2.8 • 45mm

Figure 6.31 The same freeway with the lens tilted upward and set to f/2.8. Increase the miniature effect by photographing from an elevated position, such as this nine-story parking garage.

The miniature effect is based on a vertical tilting of the lens. However, nothing is stopping you from tilting the lens horizontally. Simply use the lock near the lens mount to rotate the lens on the camera, and your tilting capabilities move horizontally. Although tilting the lens horizontally, even with a shallow depth of field, does not result in a miniature effect, it creates a great way to showcase important subject matter (Figure 6.32).

ISO 100 • 1/2500 sec. • f/2.8 • 85mm

Figure 6.32 Tilting the lens horizontally results in a creative, view-camera-type look.

Portraits

We are all drawn to portraits with a soft background and foreground and tack-sharp focus on the subject. But what if you wanted the background and foreground out of focus as well as everything else except the subject's head? No worries. You can do that with a simple tilt of the lens and some precise focusing.

Creating unique portraits with the Tilt function is similar to creating the miniature effect, except you do not need to be above your subject. For example, this portrait of my brother, Seth, was shot from slightly under him (he is much taller than me) with the lens tilted all the way to the left (**Figure 6.33**). I set the aperture at f/2.8. Be aware that using the maximum aperture for portraits may result in a harder time focusing on the subject's eyes or face. The effect you are going for is possible using a stop or two down from maximum. You can also rotate the lens (using the aforementioned lock switch) on 30-degree angles to create even more focusing possibilities for your portraits (**Figure 6.34**).

ISO 100 • 1/1250 sec. • f/2.8 • 45mm

Figure 6.33 With the focus on the subject's left (camera-right) eye, a tilted portrait offers another creative perspective.

ISO 160 • 1/640 sec. • f/2.8 • 85mm

Figure 6.34 Whether horizontal or vertical, portraits made with perspective-control lenses can be fun to make. It's easier to keep both eyes in focus if the tilt is vertical.

Panoramas

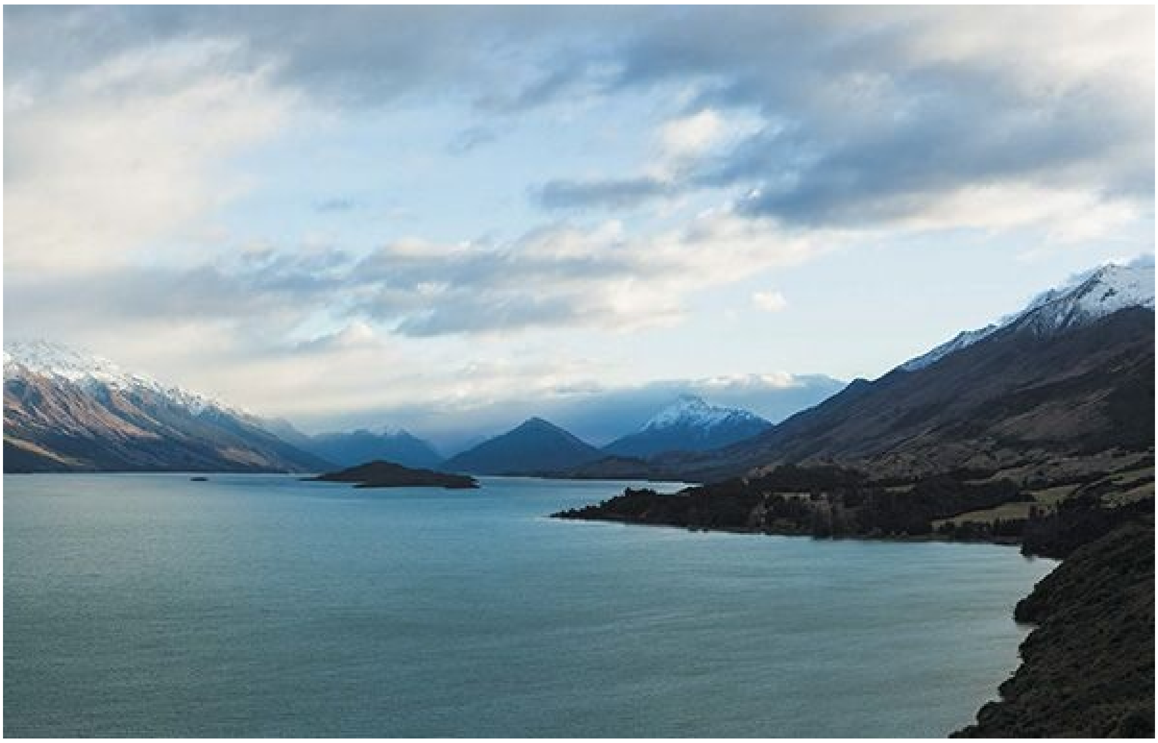
Perspective-control lenses are also great for creating images that stitch together in a panorama. The first, and probably the easiest, way to shoot a panoramic image with a perspective-control lens is to simply shoot multiple images along a Shift range. You need to set up the camera on a tripod the same way you would when correcting distortion: Level it out so the horizon is in the middle and the vertical lines are straight up and down. Now, with the Shift knob, shift the lens along its horizontal range (you can also do this vertically), shooting an overlapping image at each full mark highlighted on the lens. You will create five images that can then be stitched together in post with software such as Adobe Photoshop (**Figure 6.35**). This technique can be used with any of the perspective-control lenses available, even the wide-angles. The optical distortion of such lenses is corrected before the shooting begins, so there is no need to worry about the wide angle being an issue.

ISO 100 • 1/200 sec. • f/9 • 45mm

Figure 6.35 A panorama comprised of five vertical images shot by shifting the lens horizontally. Although not particularly long, the pano showcases a wide perspective without the optical distortion associated with wider focal lengths.

The second way to create a pano with a perspective-control lens is more traditional. Again, a tripod is necessary, as well as a tripod head designed for panoramic photography (**Figure 6.36**). This type of head is designed so you can rotate the camera without having to loosen the entire structure, risking moving the camera out of line. In this scenario, a perspective-control lens atop the tripod (shifted for perspective control) is rotated in set increments to create multiple overlapping images. This setup is more for those instances when the Shift range of a lens is not long enough for the very long panoramas we're used to seeing in galleries. However, this technique of creating panos is losing steam due to the advancements in stitching software and high-resolution cameras. Many folks are now handholding their panos (**Figure 6.37**). As a side note, it is best to shoot these types of panos with the camera turned to a vertical orientation.

Figure 6.36 **A Manfrotto Virtual Reality and Pan Pro Head is an odd thing to look at, but with some technical training, you'll find it the perfect complement to a PC-E Micro-Nikkor 45mm f/2.8D ED for panoramic photography.**



ISO 200 • 1/200 sec. • f/8 • 70mm

Figure 6.37 I handheld this nine-shot pano of Lake Wakatipu near Queenstown, New Zealand. The images were overlapped enough for Photoshop CC to easily stitch them together in post.

Perspective-Control Lens Considerations

Along with a perspective-control lens's special properties and unique look comes a learning curve. Once you use these lenses for some time, the mindset becomes second nature, but there are a few things to keep in mind when starting out.

First, there is no autofocus. There's nothing you can do about it other than learn to love manual focus. Fortunately, the focus rings on these lenses are sensitive and nice turners.

Second, the focus shifts a little when you use the Tilt function. When you tilt the lens to one extreme or the other, you should notice either in Live View or in the viewfinder that the focus moves. Keeping this in mind will force you to tweak the focus back to where you want it and save you the frustration of seeing the image out of focus later on the computer screen. This movement does not occur when you *shift* the lens, but it is always wise to focus before tilting or shifting.

Third, it is best practice to shoot from a tripod. In many situations, especially portraits, you may not need to shoot from a tripod. However, when you need to shift the lens quite a bit—particularly for panoramas—the tripod is worth its weight in gold. For example, I have tried to handhold shots that corrected for keystoning, and I usually pointed the camera either up or down during that split second of exposure, reintroducing the distortion I wanted to mitigate. Don't consider the tripod a hindrance when using perspective-control lenses. Consider it part of the package.

Fourth, experiment. This is not an issue but rather an encouragement to let yourself explore using these interesting pieces of glass. There are a lot of so-called rules about using perspective-control lenses. Feel free to break the rules. Turn knobs, flick switches, and photograph anything to get a sense of the lens and its visual possibilities for your work.

Chapter 6 Assignments

Although specialty lenses can be used as prime lenses, they excel in those niche areas for which they are manufactured. Whether you own one, are looking to buy one, or are renting one for a weekend photo walk, take some time to work the lens the way it was intended. Use the following assignments to improve your technical and creative skills.

Push in tight

Using close-up lenses is all about seeing the possibilities in a very small space. One of the best areas to explore with a close-up lens is a small garden. Look for interesting subject matter to shoot, and find out how far you can push the lens in and maintain focus. Open the aperture up all the way and create mystical dreamscapes of color, but also pay attention to how low amounts of depth of field can be potentially distracting. Compose at all angles, giving special consideration to creating abstract leading lines to the primary subjects. Learn how to be patient by spending time with each subject (to start off, try working each small subject for at least ten minutes).

Adjust for keystoning

Take the wide-angle perspective-control lens, the PC-E Nikkor 24mm f/3.5D ED, and go hunting for structures that would normally keystone a great deal if shot at this focal length. Consider photographing a large church or just about any building that is over two stories high. The taller the building, the more extreme the keystoning. Shoot the building from a nice angle (or several), and correct for distortion. It's best to use a tripod. First, shoot the building at the desired angle, keystoning and all. Second, level the camera to where all vertical lines are exactly that: vertical. More than likely, this will cut the top of the building out of the frame. Third, use the lens's Shift function to shift the optics up, bringing the structure fully into the frame at the angle you originally desired without the keystoning. Keep in mind that if you are too close to the structure, you may not be able to shift up enough to include the top of the building in the frame (so back up). Do this for both horizontal and vertical shots of the structure.

Create small worlds

Master the miniature effect. From an elevated position, such as a pedestrian bridge, building rooftop, parking structure, or even a ladder, identify subject matter and composition that would make for a great miniature-effect shot. I like to shoot traffic along city roads. Using a perspective-control lens (I suggest a 24mm or 45mm), make a shot or two of the scene sans miniature effect to give you an idea of the composition. Then, simply tilt the lens upward and open the aperture up all the way. You will more than likely need to refocus after tilting. See the miniature effect come alive in the viewfinder. You can increase the depth of field if desired, but don't do it too much or the effect will dissipate. Remember to be careful while shooting from an elevated position! Few shots are worth falling and breaking bones.

Share your results with the book's Flickr group!
Join the group here: www.flickr.com/groups/nikonlenses_fromsnapshotstogreatshots

7. Accessorizing

ISO 100 • 1/200 sec. • f/1.8 • 85mm

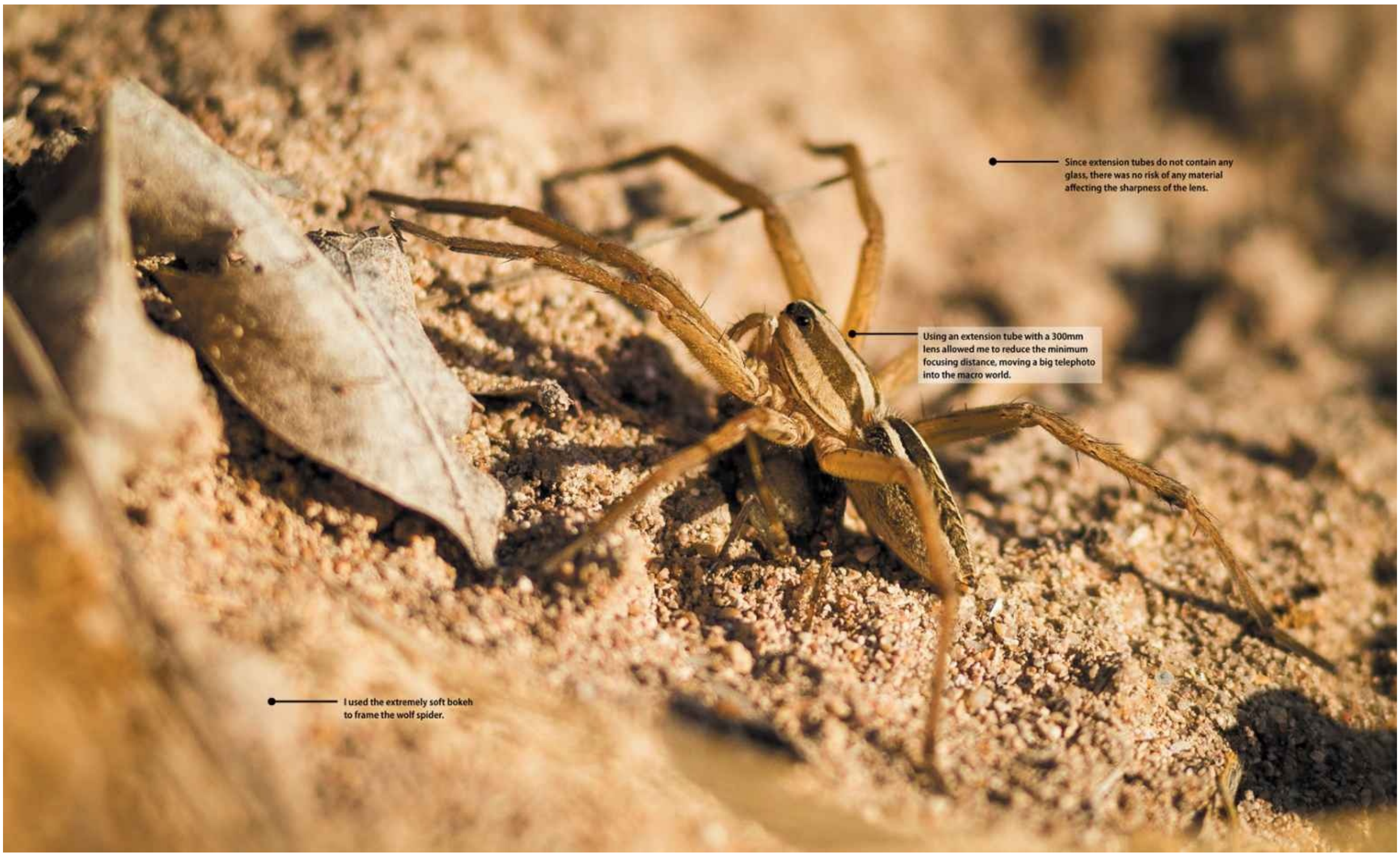
Lens add-ons that work

When you purchased your camera and lens, whether online or in a store, you were likely asked if you wanted to add some extras to your shopping cart—a gear bag, perhaps a memory card or two, and for the lens, maybe a UV and/or polarizing filter.

Accessories are the ancillary tools that work in concert with your new gear. There’s an entire industry built on proprietary and third-party accessories. Do you need them? Maybe, maybe not. It’s inevitable that we’ll pick up certain gadgets that help us make pictures along the way, and some of these gadgets are made specifically for your lens(es).

This chapter highlights some of the most popular lens accessories. There is a world of niche accessories not explored here; you can find more-obscure and lesser-used tools for your lenses in any camera store or online retailer. The most important accessories of all—hoods, lens caps, and cleaning supplies—are covered in the next chapter.

Poring Over the Picture



ISO 200 • 1/1600 sec. • f/4 • 300mm with extension tube

I used the extremely soft bokeh
to frame the wolf spider.

Teleconverters

When you survey the field of Nikon telephoto lenses, you'll notice that going longer means digging deeper into your pocket. It also means carrying some more weight on your shoulder. The solution to both of these issues lies in Nikon's three *teleconverters*, devices that extend the focal length of the lens to which they are attached (**Figure 7.1**).

Figure 7.1 Nikon's three teleconverters—the AF-S Teleconverter TC-14E III (left), the AF-S Teleconverter TC-17E II (middle), and the AF-S Teleconverter TC-20E III (right)—are good for reaching out in genres such as wildlife and sports. (Photo by Alan Hess.)

How They Work

Nikon's three models are the AF-S Teleconverter TC-14E III (commonly referred to as the *one-four*), the AF-S Teleconverter TC-17E II (the *one-seven*), and the AF-S Teleconverter TC-20E III (the *two-X*). The focal length of any lens used in conjunction with the teleconverters is simply multiplied by the factor in the accessory's name. For example, a one-four teleconverter used with a 200mm focal length (1.4 x 200mm) will produce a focal length of 280mm. A two-X teleconverter used with the same focal length (2.0 x 200mm) will provide an effective 400mm focal length. The teleconverters, which are built with similar construction to the telephoto lenses themselves, use optic-grade glass to perform the focal length magnification. The setup is pretty simple—just attach the teleconverter to the camera body like you would any other lens, and then attach the lens to the teleconverter.

Using a teleconverter is an excellent way to go long without needing to acquire another lens. I often carry a one-four or two-X with me when I travel and need to keep the amount of lenses I pack to a minimum. However, they are also popular with wildlife and sports photographers who already use extremely long focal lengths. A 400mm lens quickly becomes a 560mm lens with the one-four, a 680mm with the one-seven, and 800mm with the two-X. Talk about versatility in a small package (**Figures 7.2**, **7.3**, **7.4**, and **7.5**)! Bird and other wildlife photographers love teleconverters since controlling their subject matter's distance from the lens is often impossible or comes at great risk (think grizzly bears).

ISO 400 • 1/8000 sec. • f/2.8 • 200mm

Figure 7.2 Photographed without a teleconverter, the flowers placed at one of the many gravesites are insignificant in size. (Photo by Alan Hess.)

ISO 400 • 1/3200 sec. • f/4 • 280mm (200mm with 1.4X teleconverter)

Figure 7.3 A one-four teleconverter pushes the 200mm focal length to 280mm, pushing in tighter on the pattern of headstones. (Photo by Alan Hess.)

ISO 400 • 1/2500 sec. • f/4.8 • 340mm (200mm with 1.7X teleconverter)

Figure 7.4 From the same position, a one-seven teleconverter produces an even tighter look, this time at 340mm. (Photo by Alan Hess.)

ISO 400 • 1/1600 sec. • f/5.6 • 400mm (200mm with 2X teleconverter)

Figure 7.5 At 400mm, the many lines of headstones are reduced to three rows, and the flowers play a greater role in grabbing your attention. (Photo by Alan Hess.)

Teleconverter Caveats

Teleconverters sound great, right? For the most part, they *are* great. However, there are a few things to ponder before purchasing.

First, Nikon’s teleconverters only work with certain Nikon lenses. I highly encourage you to seek out which lenses are compatible with the teleconverters (typically telephoto lenses). As of this writing, there are 27 Nikon lenses that seamlessly attach to their teleconverters, all of them FX-formatted lenses. These lenses have rear elements that are deep enough within their construction that the converting optics in the teleconverters can fit snuggly inside (**Figure 7.6**).

Figure 7.6 Optics contained within a teleconverter and the way teleconverters are constructed to work with Nikon lenses limit the lenses with which they can be used. (Photo by Alan Hess.)

The second issue to consider is the effect teleconverters have on maximum aperture. Using a one-four teleconverter will cost you one stop of aperture, a one-seven will reduce it by another half stop, and the two-X will cost you two. For example, if you are using a lens that opens up to f/2.8 and you slap a one-four on it, you can only open the aperture to f/4. With a one-seven, the maximum aperture would be f/4.5, and with a two-X, the maximum aperture would be f/5.6. This issue alone might keep some folks from investing in a teleconverter. The AF-S Nikkor 300mm f/4D IF-ED is a great lens for many applications, but after attaching it to a two-X teleconverter, you can only open up to f/8. This isn’t necessarily an issue when it comes to depth of field, but in losing two stops of aperture you lose two stops of light and are forced to shoot with a much slower shutter speed (two stops slower) or bump your ISO up two stops (which increases the noise in the image).

Third, teleconverters can slow down or eliminate autofocus capabilities. A camera's autofocus system needs light for it to detect contrast and find focus. By putting a teleconverter between the camera and lens, and reducing the maximum aperture of said lens, you are essentially reducing the amount of light let in through the lens and detected by the autofocus sensor. The greater the reduction in maximum aperture, the slower the autofocus becomes. Imagine shooting a fast-paced sports game with a sluggish autofocus system. But where does it fail completely? Anywhere past f/8 on most newer cameras, including the D7100. At f/8 (a combination of an f/5.6 lens and a one-four teleconverter, or an f/4 lens and a two-X teleconverter), autofocus is typically sluggish. Combine a two-X converter with an f/5.6 lens (f/11 maximum aperture) and say goodbye to autofocus.

Re-emphasizing a point made in Chapter 5, the fourth issue to consider is what extending the focal length means for your minimum sustaining shutter speed. Using a teleconverter may necessitate putting the camera on a tripod or monopod to accommodate the longer focal length and the increase in sensitivity to any lens movement.

Fifth, some photographers claim that teleconverters degrade image quality. It's true that putting another piece(s) of glass between your lens and camera might introduce certain deficiencies. It's hard to detect, but teleconverters can magnify the effect of a lens's chromatic aberration and some vignetting. Nikon's newly designed teleconverters work hard to mitigate the negative effects.

Finally, even though teleconverters are cheaper than new telephoto lenses, they're still not cheap. Each of the three teleconverters is somewhere north of US$500 after tax.

Extension Tubes

In the previous chapter, I highlighted how great Nikon's close-up lenses are for getting in tight on small subject matter. What if there was a way to do the same thing—minimize the focusing distance of your lens—without forking over the cash for a new piece of glass and without sacrificing image quality? You'd probably say, "Sign me up!" Enter extension tubes.

How They Work

Extension tubes look and feel like teleconverters, but there is no glass inside their barrel construction (**Figure 7.7**). They are simply tubes—placed between your lens and the camera—that decrease the minimum focusing distance by moving the lens's optics away from the camera's sensor, and in some cases, allowing you to push the lens much closer to the subject than any close-up lens allows. A telephoto zoom lens, such as an AF-S Nikkor 70–200mm f/2.8G ED VR II, is my favorite lens to combine with one or more extension tubes. (The tubes work equally well with a shorter lens, such as an AF-S Nikkor 24–120mm f/4G ED VR.) I like using zoom lenses with extension tubes because the zoom ring becomes more of a focus ring. With a bit of experience, you can become comfortable using extension tubes by moving in tightly on a subject and using the zoom ring to manipulate focus. The focus ring will also fine-tune where the image is sharp, but it serves a lesser role in these circumstances.

Figure 7.7 Like teleconverters, extension tubes fit between the body of the camera and the lens.

You can purchase extension tubes individually or as a package of three. They come in various sizes; the longer the tube, the tighter you can push in on a subject. I usually advise purchasing proprietary gear when you choose a camera system, but I use Kenko extension tubes (**Figure 7.8**). For about double the price of one Nikon tube, you can purchase a set of three Kenko tubes that retain autofocus, transmit data electronically from the lens to the camera, and fit both FX and DX lenses. For around US$200, you can convert just about any lens you own into a close-focusing macro lens. Since the tubes don't include glass, you don't need to worry about them degrading the optical quality of a lens. Some vignetting may occur, and if all three tubes are used in conjunction with your lens, some light may drop off, but sharpness is not a concern.

Figure 7.8 For US$200, a set of three Kenko extension tubes can turn any of your Nikon lenses into a close-focusing macro machine.

Using Extension Tubes

Extension tubes share many of the same rules and techniques as traditional close-up lenses. It is best and most stable to put a camera-extension tube(s)-lens combination on a tripod. The lens is more sensitive to movement in the macro world, and the tripod adds more stability than the human body. Using a shutter release also helps prevent movement in an image (**Figure 7.9**).

Figure 7.9 I often wrap my shutter release cable around the lens barrel and extension tubes when shooting macro to keep it close at hand while carefully composing images in the little world.

Also, become comfortable with manual focus. Even though Kenko extension tubes allow you to use autofocus, in many macro settings autofocus can get in the way. Using the lens's zoom ring as a focus pull gives you much more nuanced control over the focal plane, especially when you have your composition just right and need to tweak focus just a bit (**Figure 7.10**).

ISO 200 • 1/80 sec. • f/4.5 • 105mm with extension tube

Figure 7.10 I shot this magazine cover in my office with nothing more than a standard zoom lens, a small piece of white fabric, a couple of lights, and one extension tube.

Last, have fun and experiment. As I said in the previous chapter, I enjoy the stress-relieving qualities of shooting macro. Be patient and methodically try out different compositions, using one, two, or three of the extension tubes in tandem. Becoming comfortable with how the tubes work will result in some interesting images (**Figure 7.11**).

ISO 50 • 1/160 sec. • f/4 • 115mm with extension tube

Figure 7.11 A small extension tube on a telephoto lens can help you push in just a bit more for a dramatic image.

Keep in mind that like with close-up lenses, using a shallow depth of field may result in an image that either misses focus on the primary subject or one that renders the subject “unreadable” (**Figure 7.12**).

ISO 50 • 1/8000 sec. • f/2.8 • 93mm with extension tube

Figure 7.12 I nailed the focus on the front of the flower, but the first flower didn’t stand out from the one in the background. Using extension tubes on an already fast lens resulted in a short, soft depth of field.

Filters

The ultimate lens accessory is a filter. Or perhaps several filters. Filters are valuable to photography and they can be employed strategically and creatively in your work. Yet, filters are probably the accessories that cause the most consternation among photographers. I don’t use them much, except for the occasional neutral density filter.

There is a large variety of filters out there. The following sections highlight three of the most popular types. Like most camera gear, filters come at several different price points via several manufacturers. They are also manufactured out of different materials, such as glass, plastic, and a high-quality resin. While filters do get expensive, it is in the buyer’s best interest to not go cheap. That doesn’t mean you must buy the priciest filters available, but it does mean do your research. I try to avoid plastic filters altogether.

UV Filters

Perhaps the most popular filter is one that greatly reduces or completely blocks ultraviolet (UV) rays from passing through the lens (**Figure 7.13**). UV filters have been around for a while. Film was especially prone to the effects of UV rays, which are invisible to our eyes. UV filters were an essential addition to many film photographers’ lenses, helping to mitigate loss of contrast and an anemic haziness sometimes seen on film.

Figure 7.13 It would be easy to mistake a good UV filter as simply another clear piece of glass in front of a lens.

UV filters still do what they have always done, but since digital sensors are not affected by UV rays, these filters are less relevant now. It’s hard to detect the lens’s effect (**Figures 7.14** and **7.15**). They do come in handy where UV rays are prevalent, such as at higher altitudes. However, these days many folks simply fix any issues in postprocessing.

ISO 100 • 1/320 sec. • f/5.6 • 70mm

Figure 7.14 This shot was taken without a UV filter.

ISO 100 • 1/320 sec. • f/5.6 • 70mm

Figure 7.15 With a UV filter in front of the lens, it is hard to detect whether the filter has any effect on the image.

Why even consider buying a UV filter? One very important reason: to protect the front element (**Figure 7.16**). Imagine dropping your lens and the front element hits something jagged or hard. Having a good UV filter in front of that element is like having an extra insurance policy on it as you go banging through the streets. And, if it prevents any negative effects of UV rays along the way, all the better. This is also why I always use my lens hood—to reduce the chance that my front element ever comes in contact with anything.

Figure 7.16 **UV filters offer great protection for your lens's precious front element, and they are being manufactured by some companies, like Cokin, in a thinner form than in previous years.**

With this protection comes a risk of decreased image fidelity, which is why I don't use a UV filter often. (It is worth pointing out that any filter will degrade the quality of the image.) That being said, many photographers claim that good UV filters don't negatively impact image quality.

Compared to other types of filters, UV filters are relatively inexpensive. And they are the type of filter you can leave on your lens all the time. Make sure you purchase a multicoated glass filter that is less prone to greasy smudges and scratches.

Polarizing Filters

Unless you've taken a physics or engineering course, polarization may be a tough subject to swallow. My head still spins when someone tries to explain vertical and horizontal (both linear) and circular polarized light, as well as unpolarized light. Essentially, photographers use a polarizing filter to manipulate light. Certain light waves in a field of vision that are not polarized the same way as others can simply be blocked from entering the lens via a polarizing filter.

Circular polarizers and position

For photographers, the most popular type of polarizing filter is the one called a circular polarizer (Figure 7.17), a rotating filter that allows the user to block different light waves based on their polarization. For example, when the filter is rotated to allow only vertically polarized light to pass through, horizontally polarized light is barred entrance. All other light waves that are neither vertical nor completely horizontal are only partially allowed through depending on their angle to those two axes.

Figure 7.17 A circular polarizing filter allows the photographer to dial in the appropriate angle of polarization by spinning the outer ring.

Practically speaking, colors become more saturated and reflections disappear when you bar some light with a polarizing filter. As you rotate the filter, the angle of light allowed through changes, enabling you to take advantage of polarized light waves entering the lens at many different angles (**Figures 7.18**, **7.19**, **7.20**, and **7.21**). You can see this change take place through the viewfinder or Live View display as you rotate the filter. It is very difficult, if all but impossible, to replicate this type of physical effect through postprocessing.

ISO 100 • 1/100 sec. • f/5.6 • 24mm

Figure 7.18 **Even on an overcast day, a bronze statue can reflect a large amount of light.**

ISO 100 • 1/100 sec. • f/5.6 • 24mm

Figure 7.19 **When you turn the outer element on a circular polarizer, certain light waves are barred from passing through the lens, resulting in a different reflection in the statue.**

ISO 100 • 1/100 sec. • f/5.6 • 24mm

Figure 7.20 Turning the polarizing filter even more continues the change in reflection.

ISO 100 • 1/100 sec. • f/5.6 • 24mm

Figure 7.21 While you turn a polarizing filter, the change in effect is continuous and visible through the viewfinder, letting you fine-tune the amount of polarization for any particular light-wave orientation.

Note that the effect of the filter is strongest at 90-degree angles from the direction of the sun, and it lessens the more you point toward the sun or directly away from it. For example, since the sun rises in the east, you would need to point your camera either north or south to see the effect of the filter, as opposed to due west.

Saturation

During the middle of the day, light and color can be weak, especially in a digitally captured image. Time for a polarizing filter. At an appropriate position to the sun, rotate the filter against a weak blue sky to get a saturated blue that contrasts nicely with white clouds (**Figures 7.22** and **7.23**). At its most saturating, the filter is barring the prevailing angle of polarized light and essentially underexposing the sky as a result of this reduction in light passing through the filter.

ISO 100 • 1/200 sec. • f/5.6 • 17mm

Figure 7.22 Late-morning light can dull an otherwise interesting sky with good cloud structure.

ISO 100 • 1/200 sec. • f/5.6 • 17mm

Figure 7.23 A circular polarizer can saturate the blue in the sky and boost the contrast between the blue and the white clouds.

Be careful not to oversaturate. If the sky appears very dark (note that the higher in elevation you go, the darker the sky), it might not fit with the foreground exposure or content, producing an unrealistic-looking image (**Figure 7.24**). After making a few images of a sky at what seems like the correct level of color, rotate the filter back just to be sure you haven't gone too far (**Figure 7.25**).

ISO 100 • 1/400 sec. • f/5.6 • 24mm

Figure 7.24 Even though the result is dramatic, a polarizing filter's saturation can go a bit too far, as shown in the sky above the lit building.

ISO 100 • 1/400 sec. • f/5.6 • 24mm

Figure 7.25 Recognizing that the saturation is too much for the content, rotate the filter back to lighten the sky.

Polarizers sometimes stand out when used in conjunction with wide-angle focal lengths. Since such focal lengths have wide angles of view, the field of view captured in the frame may include areas of the sky that are not at 90-degree angles from the sun. The result is a band of saturation that will appear close to that 90-degree mark but nowhere else (**Figure 7.26**). It is awkward to have this band of color move through the frame with two areas of nonsaturated color on both sides of it in the sky.

ISO 100 • 1/250 sec. • f/5.6 • 17mm

Figure 7.26 Even at a 90-degree angle to the sun, an ultra-wide focal length with a polarizer can produce an obvious saturated band in the sky.

Reflections

Polarizers are also great for cutting through reflections. Imagine shooting through a window from a city sidewalk. More than likely, you will capture a reflection of the building across the street or something else outside the window. You can use a circular polarizer to reduce the light waves that create this reflection, allowing you to make a picture of what is inside the window (**Figures 7.27** and **7.28**).

ISO 100 • 1/60 sec. • f/4 • 30mm

Figure 7.27 Without a polarizing filter, the reflection of the vehicle in the window is quite distracting.

ISO 100 • 1/60 sec. • f/4 • 30mm

Figure 7.28 A polarizer blocks the light waves responsible for the vehicle’s reflection.

The same technique applies to reflections on highly specular surfaces, such as water, oily roads, and just about any shiny surface that is mostly horizontal to your position. Instead of being blinded by the light reflecting off water (**Figures 7.29** and **7.30**), use a circular polarizer to cut through such reflections. If the water is clear enough, you can see what lies below its surface (**Figure 7.31**).

ISO 100 • 1/1250 sec. • f/5.6 • 300mm

Figure 7.29 **Bright, distracting specular highlights dot the surface of the Llano River.**

ISO 100 • 1/125 sec. • f/5.6 • 70mm

Figure 7.30 **Even with overcast skies, reflections in the water can shine fairly bright.**

ISO 100 • 1/125 sec. • f/5.6 • 70mm

Figure 7.31 A polarizer can mitigate the presence of that reflection, and with calm waters, allow you to see past the surface.

Finally, polarizers are great in reducing the light reflections on some vegetation. I like overcast days for shooting plant life, but a sunny day is not necessarily reason to quit shooting as long as you have a polarizing filter. For a lot of green vegetation with reflective leaves, you can reduce the brightness and reveal detail in the leaves and plant surfaces in the image (**Figures 7.32** and **7.33**). The polarizer reduces contrast (much like the overcast sky does) and helps bring out colors in the vegetation.

ISO 100 • 1/160 sec. • f/2.8 • 70mm

Figure 7.32 Glossy green leaves can often be highly reflective, resulting in a loss of detail in the specular areas.

ISO 100 • 1/160 sec. • f/2.8 • 70mm

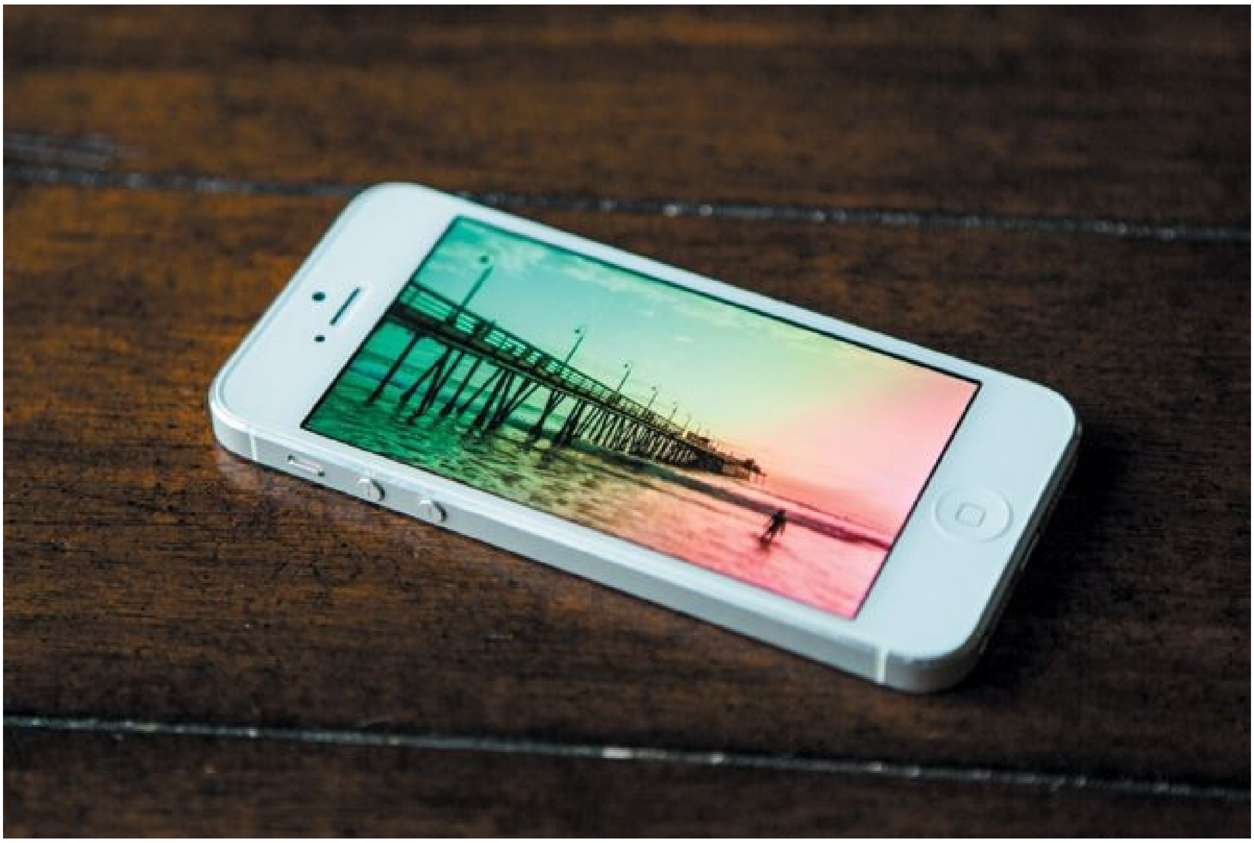
Figure 7.33 Use a circular polarizing filter to reduce the reflections, bring back detail to the leaves, and saturate the greens.

Polarizer best practices

Aside from keeping a polarizer at a right angle to the direction of sunlight, here are three best practices for working this kind of filter.

First, you must take into account the drop in exposure caused by a polarizer. When a polarizer blocks certain light waves from passing through, it also reduces the amount of exposure by up to two stops. Be sure to compensate for this drop in exposure by slowing down your shutter speed. But note that if you open up your aperture to make this compensation, you also change the image's depth of field.

Second, be aware of what is called *birefringence* when pointing a polarizing filter toward surfaces like LCD monitors, tinted windows, and certain translucent plastics such as those that cover some smartphones (Figure 7.34). If you wear polarized sunglasses, you know exactly what this is. Birefringence shows itself as a rainbow effect on some surfaces. Although this psychedelic effect can be interesting, many people frown upon it. Note that if you rotate the circular polarizer enough, you can block all light emitted from these types of surfaces, especially computer LCDs.



ISO 400 • 1/60 sec. • f/2.8 • 70mm

Figure 7.34 Although birefringence adds an interesting, psychedelic effect when you photograph surfaces like a smartphone screen, it's a distracting element in a shot.

Third, it's not a good idea to use a polarizer at night or in dark interiors. It's hard to see through them when there is not much light. Remember that, depending on its rotation, a polarizer can reduce the light coming through by two stops. And since an abundance of light is what makes the polarizer sing, it's just not worth keeping it on when it gets dark.

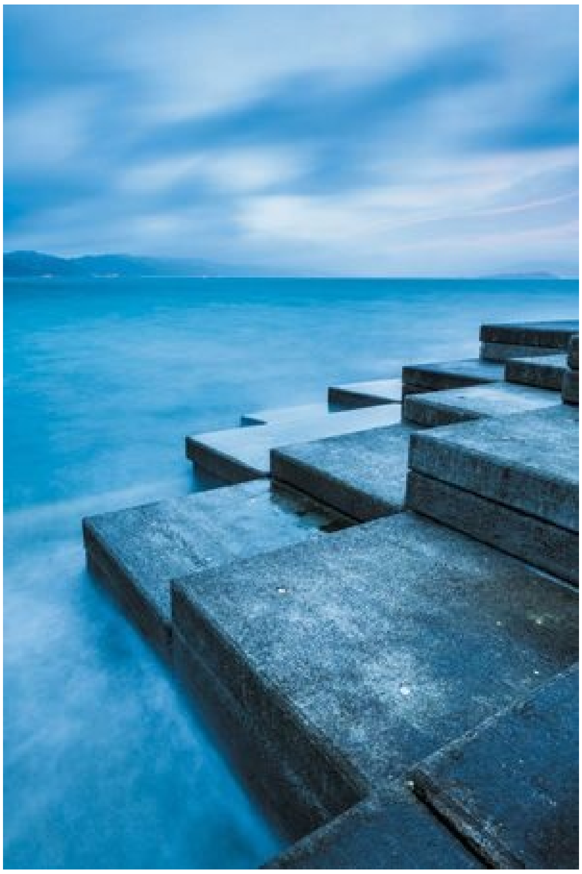
Neutral Density Filters

The type of filter I use most often is a variation on the popular neutral density (ND) filter. An ND filter is just a dark yet transparent piece of glass, resin, or plastic you put in front of your lens. It does not affect anything except exposure, hence the name *neutral*. ND filters come in several versions based on darkness, from less than one stop of light reduction up to ten stops. You can load up on several ND filters, or you can opt for a variable ND filter (**Figure 7.35**), which rotates through levels of exposure reduction. For those who want the most flexibility out of an ND filter, the variable ND is the way to go. They are more expensive than individual ND filters, but over time they are a money saver if you would otherwise buy multiple filters.

Figure 7.35 It's easy to spot a variable ND filter—the end of the lens looks as dark as an abyss!

Creative applications

So what's the big deal? It's amazing what can be achieved by having less light for the camera's meter to measure. You have seen those images of piers in lakes surrounded by what seems like swirling smoke or those waterfalls that were obviously shot with extremely long shutter speeds. Although some of these shots were made when the light was conducive to longer shutter speeds (**Figure 7.36**), others were made with the light-blocking assistance of an ND filter.



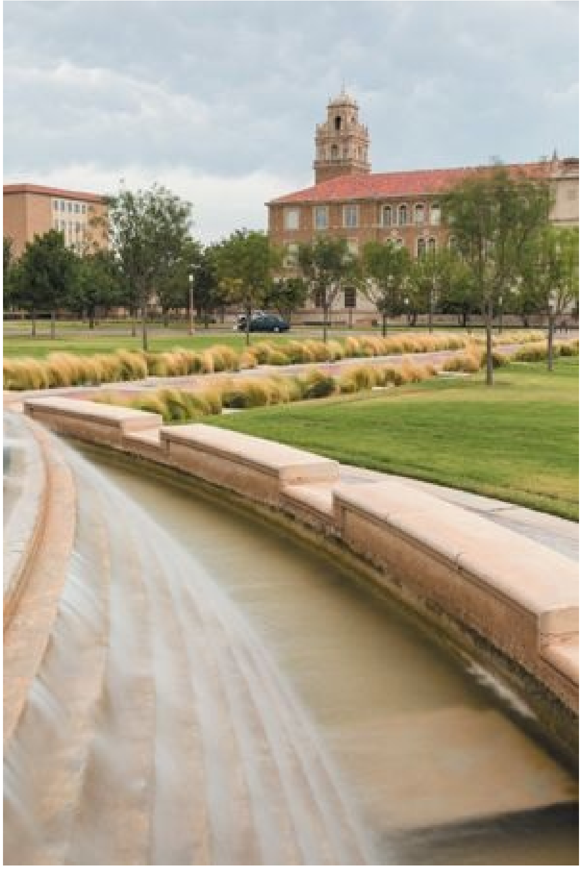
ISO 50 • 20 sec. • f/22 • 24mm

Figure 7.36 Pre-sunrise light is low enough to allow extremely long shutter speeds. However, not all situations are alike, and obtaining the same effect for the water at any other time might call for a dark ND filter.

By reducing the amount of light passing through the filter, the camera must expose much longer to compensate for that drop. This means using slower shutter speeds, and the resulting effect of such speeds on dynamic subject matter like water can be drastic (**Figures 7.37**, **7.38**, and **7.39**). We all enjoy using long shutter speeds on waterfalls, but with the help of an ND filter, the smoothing effect becomes that much stronger.

ISO 100 • 1/8 sec. • f/22 • 42mm

Figure 7.37 One-eighth of a second was as slow as I could get the shutter speed on this overcast day. It made some motion blur in the water, but the speed was too fast for a dramatic effect.



ISO 100 • 2 sec. • f/22 • 42mm

Figure 7.38 With a variable ND filter on the lens, I lowered the incoming light's intensity by four stops, resulting in a misty fountain.

ISO 100 • 15 sec. • f/22 • 42mm

Figure 7.39 With the ambient light dialed down seven stops, I was able to get a 15-second exposure and an even smoother waterfall and pool. Notice that at such a long exposure, the trees are less in focus due to the wind.

Lighting issues

ND filters also help photographers combat intense light during the middle of the day. Although high noon may not have the best or most flattering light to shoot with, it's sometimes the most convenient time. An ND filter can help take a bit of intensity out of the bright light, and as a result, the photographer can use wider apertures and achieve shallower depth of field than if she had no filter.

Many cameras have a maximum shutter speed of 1/4000 of a second. While this is fairly fast, opening a fast prime lens's aperture up to, say, f/1.4, even while using a very low ISO, may necessitate a faster shutter speed usually reserved for higher-end cameras. It will force you to close down your aperture and gain depth of field. If this is not the look you are going for, throw on a one- or two-stop ND filter, and you can then open your aperture back up (**Figures 7.40** and **7.41**).

ISO 100 • 1/4000 sec. • f/2 • 50mm

Figure 7.40 At high noon, some cameras would top out at 1/4000 of a second, forcing the photographer to stop down a fast lens and sacrifice a bit of what the lens is about—extra-soft bokeh.

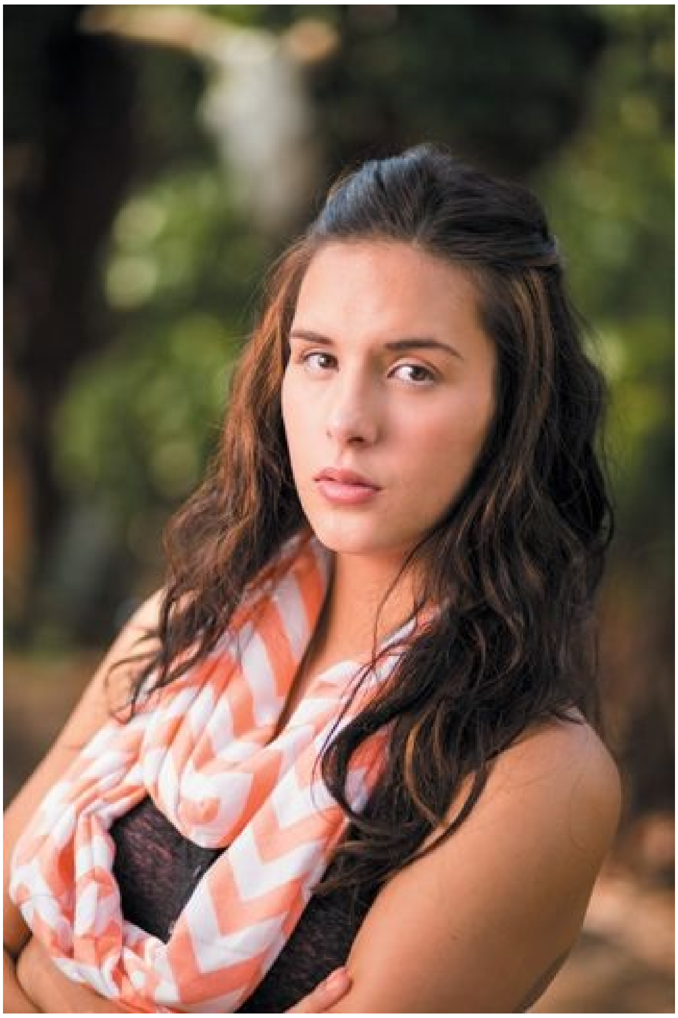
ISO 100 • 1/4000 sec. • f/1.4 • 50mm

Figure 7.41 A one-stop ND filter allowed me to recoup one stop of depth of field, and I didn't have to touch the shutter speed.

ND filters are especially useful for portrait photographers using artificial light. Many cameras paired with Speedlights or studio flash systems sync with the lights at 1/200, 1/250, or 1/300 of a second, which are not fast shutter speeds when you want to open up an aperture to f/1.8 (**Figures 7.42** and **7.43**). Using an ND filter will knock the ambient light down enough in many cases that you can slow your shutter speed to an adequate sync speed and achieve the look you want.

ISO 100 • 1/640 sec. • f/1.8 • 85mm

Figure 7.42 Although the light on Naomi is pleasant enough, the shutter speed I'm forced to use with my aperture open all the way will not sync well with my lights.



ISO 100 • 1/200 sec. • f/1.8 • 85mm

Figure 7.43 By dialing in nearly two stops of darkening filtration, I used a variable ND filter to reduce the ambient light and allow my shutter speed to sync with artificial light units, even with the aperture opened up all the way. The drop in ambient light muted the background and let Naomi stand out.

Likewise, ND filters work in a studio setting, especially when a drop in depth of field is necessary but difficult to achieve given the intensity of many standard studio flash systems (**Figures 7.44**, **7.45**, and **7.46**).

ISO 100 • 1/200 sec. • f/1.8 • 85mm

Figure 7.44 When you want to create a portrait at extremely wide apertures, like f/1.8, some studio lighting units are simply too powerful, even at their lowest setting.

ISO 100 • 1/200 sec. • f/2.8 • 85mm

Figure 7.45 **One way to offset overpowering studio lighting units is to simply stop the aperture down. However, this comes with a gain in depth of field—an effect I did not wish to have in this portrait.**

ISO 100 • 1/200 sec. • f/1.8 • 85mm

Figure 7.46 Using a variable ND filter to reduce the light by a little over a full stop, I was able to open the aperture back to f/1.8 while keeping the studio lighting unit's output the same and the shallow depth of field where I wanted it.

Graduated ND filters

A variation on the traditional ND filter is a graduated ND filter—a clear filter that gradually transitions to a darker area (**Figure 7.47**). Graduated ND filters are especially popular among landscape photographers who want to darken a bright sky above relatively dark terrestrial subject matter (**Figures 7.48** and **7.49**). For example, shooting among mountains or tall hillsides usually poses exposure issues. If you meter on the ground, the brighter sky will more than likely overexpose. Metering on the sky will render the ground too dark.

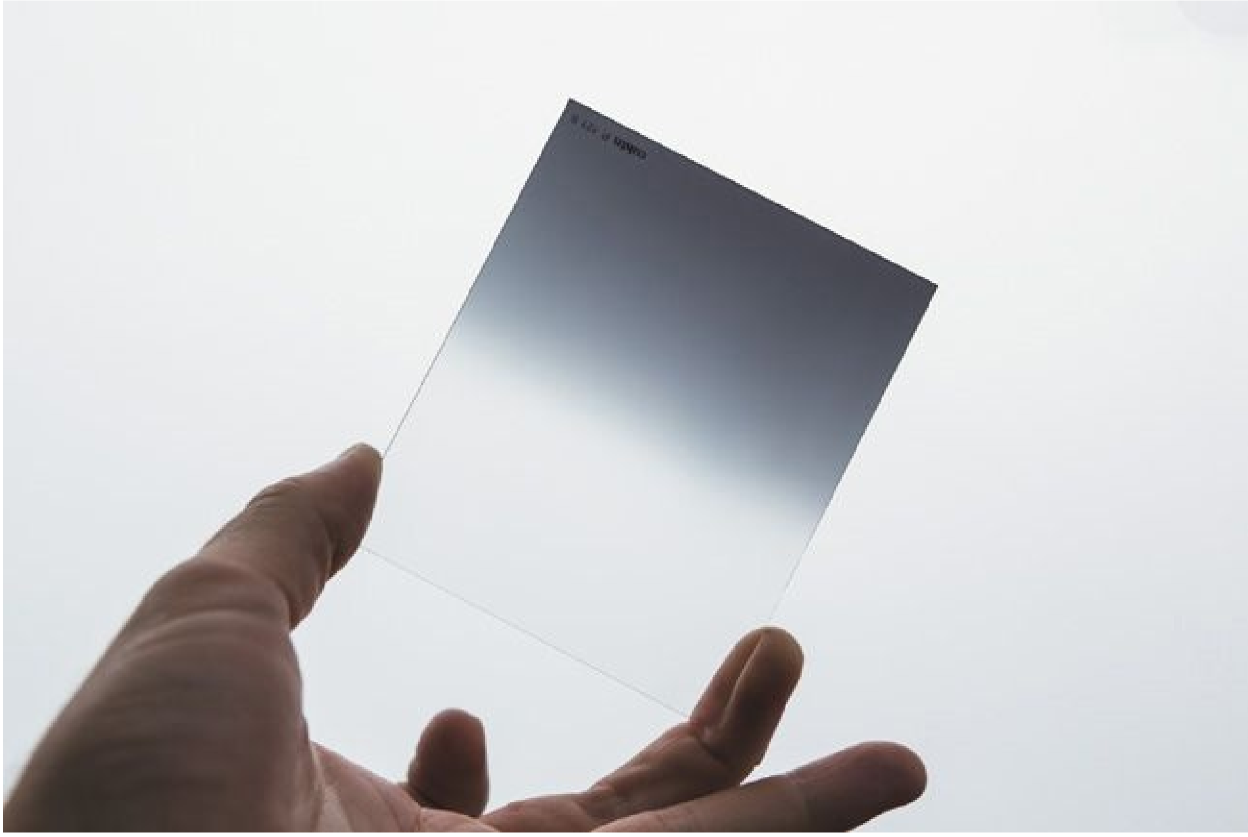


Figure 7.47 **A graduated ND filter darkens a portion of the frame while gradually transitioning to complete transparency.**

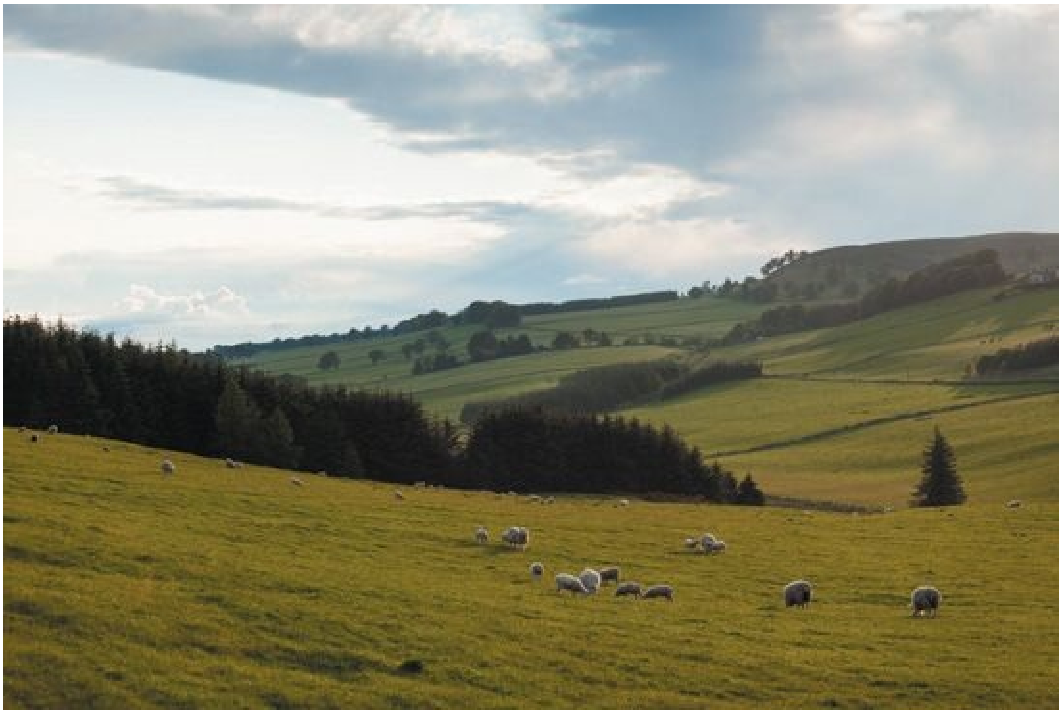
ISO 200 • 1/125 sec. • f/8 • 24mm

Figure 7.48 **The sky above the darkened foreground of this Scottish forest and reservoir is just above one stop overexposed.**

ISO 200 • 1/125 sec. • f/8 • 24mm

Figure 7.49 Using a two-stop graduated filter to darken the sky above the horizon makes for a colorful and more compelling image, and the sky matches its reflection in the water.

A graduated filter set to where the areas transition or close to the horizon in the frame will allow the photographer to meter on the ground yet subdue the bright sky and maintain detail in both areas (**Figures 7.50** and **7.51**).



ISO 100 • 1/500 sec. • f/2.8 • 70mm

Figure 7.50 The overexposed areas of the sky take away from the lovely roll of the Scottish farm hills.

ISO 100 • 1/500 sec. • f/2.8 • 70mm

Figure 7.51 A graduated filter with the transition point positioned on the upper-third horizon line helped tame the sky and save the shot.

Graduated ND filters, like their nongraduated brethren, come in various levels of darkening strength. The most popular graduated ND filters are those you can simply drop into a filter holder attached to the end of the lens (**Figure 7.52**), as opposed to screwing the filter itself to the lens. A filter-holder system like this makes using graduated ND filters an efficient process (you can use several filters together), and it also allows the photographer more precision on where the filter's graduation appears in the frame. Other types of filters, including polarizers, are often manufactured as rectangle or square drop-in filters and can be used with such a system. The entire toolset may look complicated, but it really is quite simple and useful.

Figure 7.52 A square filter holder like this Cokin system is the most efficient mechanism for working with individual or combined graduated ND filters as well as other filters in square format.

The effect graduated ND filters create can be replicated in postprocessing with software like Adobe Lightroom and Photoshop (**Figure 7.53**), and some photographers choose to bypass purchasing ND filters. However, using graduated ND filters in the field can often save you time on the computer later. Even though software programs have strong processing engines, I still haven’t seen one bring back completely overexposed highlights like a graduated ND filter can.

ISO 100 • 1/400 sec. • f/4 • 50mm

Figure 7.53 I brought the exposure of the bright sky above Edinburgh down one stop using Adobe Lightroom, one of many software applications that can be used instead of graduated ND filters.

Take Care of Your Filters

Filters can be pricey. A Cokin variable ND filter is upwards of US$180. It goes without saying that it is important to take care of them. Like lenses, filters get dirty, but luckily you can clean them like you would lenses (discussed in the next chapter). More importantly, they are more likely to fall because they're more delicate.

Much of filter care is how you handle filters when they're not on a lens. Most, if not all, filters come in some sort of case when you purchase them. Hold on to this case and always keep the filter stored in it when not in use. Some companies, like Ruggard, make filter pouches that are designed not to scratch or mar filters while in storage. Avoid transporting filters without any protection in your camera bag, and forget stuffing them in your pockets. I once loaned a graduated ND filter to a student for a day, and after carrying it around in his shirt and back pants pocket, he returned a heavily scratched (and fairly useless) ND that I threw in the nearest trash bin. Avoid touching the actual filter; handle it by its edges and frame structure.

Lens Covers

Photographers have been covering up their lenses with different materials, for different purposes, for as long as lenses have been used outdoors. The following sections highlight lens covers that can be used for transportation, blending in, and protection from the elements.

Neoprene Casings

Neoprene is a fantastic material. It is lightweight, thin, easily conformed, and impact absorbent. Neoprene makes for a great transportation and storage material for camera gear, especially for lenses. Many camera-bag manufacturers incorporate neoprene into their products, some of which are bags designed specifically for individual lenses. LensCoat is a company that specializes in neoprene wraps that can be installed around telephoto lenses that are used in rowdy environments, such as sports events and landscape and wildlife photography.

Are individual neoprene cases and covers necessary? Maybe not. It depends on the level of security you wish your lenses to have. I don’t use them. When I don’t need a lens in hand, mine goes right back to its bag (some of which have neoprene components). However, LensCoat’s neoprene covers are worth considering for protecting expensive telephoto lenses. They also help reduce the public visibility of such lenses, allowing you to remain more inconspicuous.

Camouflage

Speaking of visibility, wildlife photographers will certainly benefit from encasing their lenses in camouflage. Nikon lenses are black, but the light they often reflect off of the paint can be alarming to some species of wildlife. Imagine setting up to photograph white-tailed deer, unknowing that you won’t see one because they notice that big black blob in front of your camouflaged body. Get that lens covered up as well!

LensCoat makes several neoprene covers that are camouflaged with popular patterns, and for around US$100, you can get a lens cover that protects and blends into the environment. Not a bad deal. However, there are other options. My favorite is simply wrapping my lens with a camouflage fabric stretch wrap (**Figure 7.54**). You can pick up a 4-yard roll at a sporting-goods store for around US$8. It is thin, easily wrapped around a lens, and it stays put (**Figure 7.55**). Be sure to get a type of stretch wrap that does not leave any adhesive residue on your lens. More than likely, it is reusable in case you need to remove it and put it back on.

Figure 7.54 Pick up a roll of camouflage wrap for just a few dollars at a sporting-goods store.

Figure 7.55 In about 2 minutes, you can change an AF-S 70–200mm f/2.8G ED VR II from an odd-shaped black spectacle to an easily concealed wildlife lens.

Rain/Weather Covers

Quite possibly the most useful lens covers are those that protect your glass from inclement weather. There have been several times on the field during football season when I needed to protect my lenses from a rain or dust storm (I live in west Texas). These are great moments to employ a cover like the Think Tank Hydrophobia or the OP/TECH Rainsleeve (**Figure 7.56**).

Figure 7.56 The OP/TECH Rainsleeve is a very affordable and easy-to-use guard against the elements.

These covers fit securely around a lens's hood, and the cover encloses the camera body as well, with an opening in the rear for you to see through the viewfinder while protected from the elements. Many of the more expensive rain covers are tailored for a particular range of lenses, but other affordable options are made for general use.

To save money, grab a plastic trash bag and a rubber band large enough to fit snuggly around a lens hood. After unfolding the bag, use scissors to cut the bottom out. Place the camera and lens in the bag, using the rubber band to fit one opening around the lens hood. The other opening is an entrance for you to access the camera (**Figure 7.57**). You can customize the bag to fit more securely or to fit around a monopod or tripod. I usually carry a few large plastic trash bags in my camera bag for this reason. Here's a tip: Spend the extra US$2 for good-quality Hefty bags for increased protection.

Figure 7.57 **In a pinch, a large trash bag and a rubber band or hair band can serve as a rain cover.**

Chapter 7 Assignments

Lens accessories, such as filters and teleconverters, are optional equipment, but when the shot counts, they are invaluable. The following assignments help familiarize you with some of the more popular lens accessories.

Go macro with extensions

If you're into macro photography, extension tubes offer a very affordable way to get in close without breaking the bank. Most extension-tube manufacturers, like Kenko, offer an option to buy three together, and they can be used individually or in conjunction. Start with the thinnest tube between the camera and lens (make sure it is a lens that will reach past 85mm to get the best macro effect). See how close you can focus, paying attention to how you can fine-tune focus with the lens's zoom ring.

Make a few pictures of your subject, changing your composition as you get used to how the tubes affect the frame's content. Add an additional tube. Repeat the process, but just a bit tighter, exploring in more detail. Add the last tube to see how the ambient light drops a bit and how getting in even closer affects your composition. Notice how the depth of field decreases with every extension tube you add.

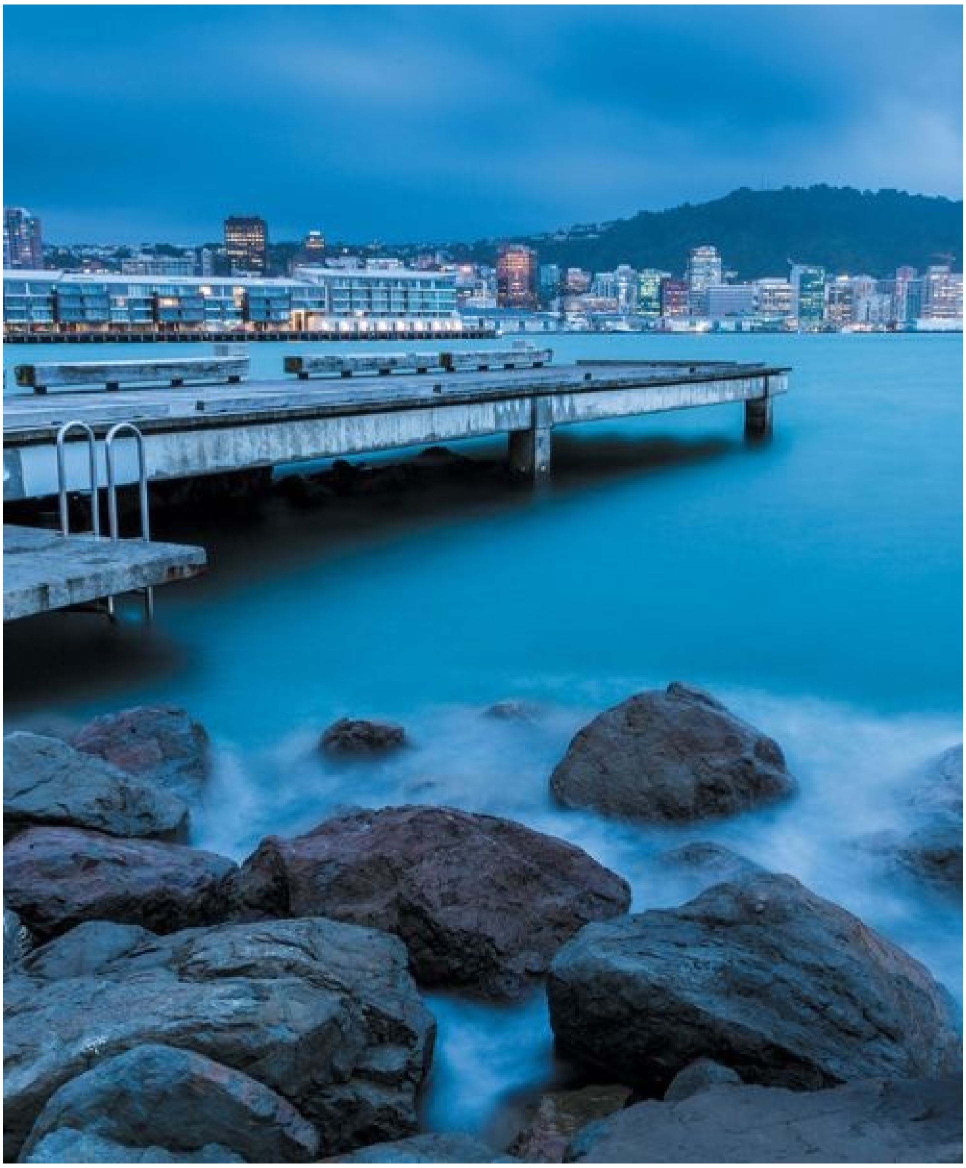
Polarize the world

A polarizing filter’s effect is the only effect that postprocessing-software applications cannot replicate. Spend a morning shooting with just your circular polarizer on a standard zoom lens. Get a feel for how it works in a number of scenarios, keeping in mind that the filter’s effect is most prominent when you point the lens 90 degrees from the sun’s rays. Shoot wide, including the sky, to see how saturated you can make the blues, noting how the changes convey different moods.

Go window-shopping on a commercial street and learn how you can eliminate reflections in shop windows by turning the polarizer. Near a lake instead of a downtown? Shoot long exposures of the lake with the polarizer to minimize distracting reflections and see through the top of the water.

Share your results with the book’s Flickr group!
Join the group here: www.flickr.com/groups/nikonlenses_fromsnapshotstogreatshots

8. Best Practices



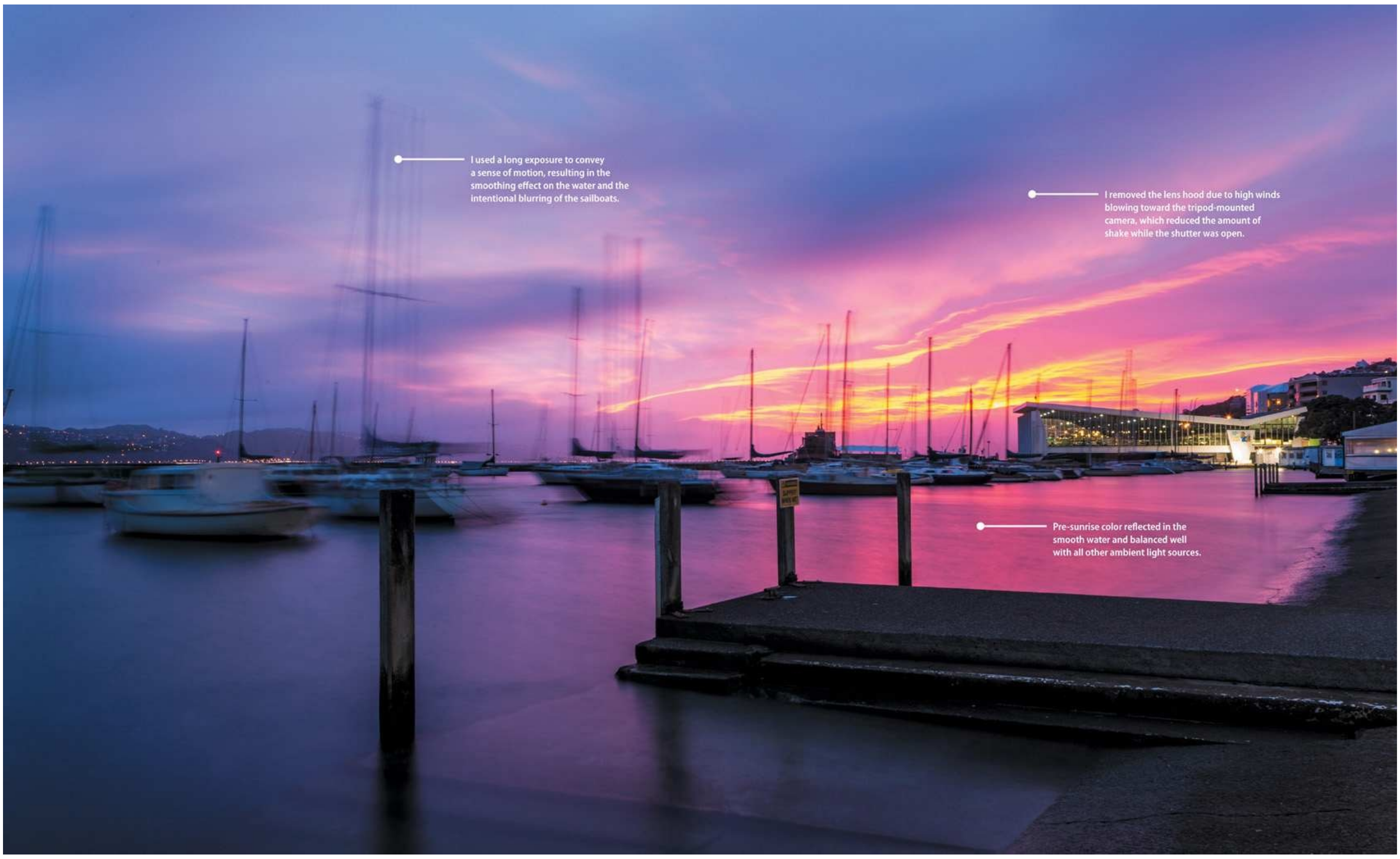
ISO 50 • 25 sec. • f/18 • 24mm

Lens care and tips for making better pictures

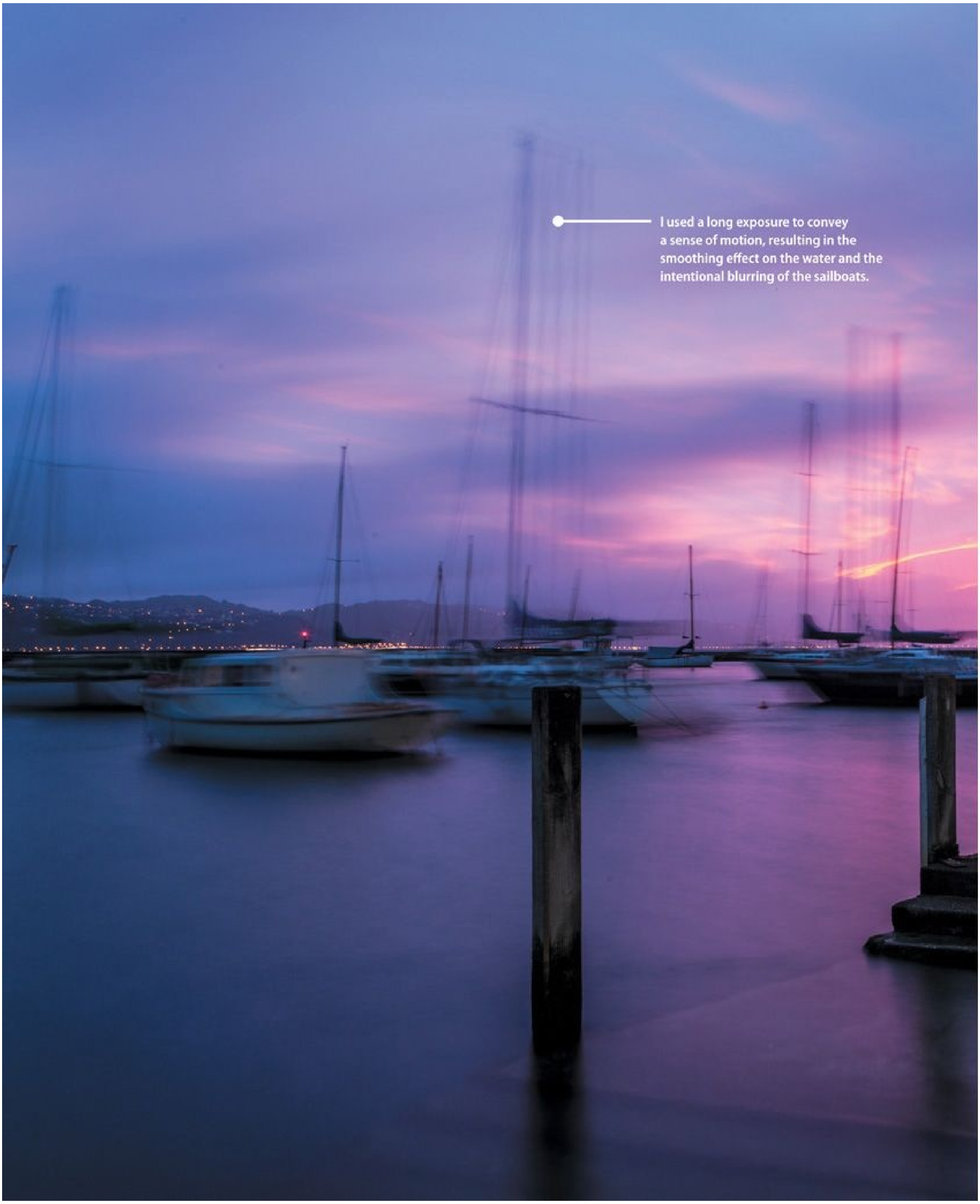
Imagine you are standing on the dock of a marina before sunrise, camera atop a tripod, and you've just lined up the perfect shot of boats. You want them to sway, so you plan a long exposure. You begin to shoot, using a shutter release. The first shot indicates a good exposure, an intentional blur of the boats, and the reflection of the sky is glorious. However, the shot is out of focus. A 30 mph wind is whipping straight at the camera, and the camera strap is knocking the camera around on the tripod. You wrap the strap around the tripod head's base. The next shot is also out of focus. You put weight on the tripod but get another out-of-focus shot. You then realize the lens hood is catching the oncoming wind. Noticing no threat of lens flare, you remove it, and the resulting shot is a keeper.

The above scenario represents a number of best practices you can employ while working with an assortment of lenses in different shooting environments. This chapter runs through a few of these best practices, from maintenance to photographing different subject matter to techniques that are unique to the lenses (as opposed to the camera).

Poring Over the Picture



ISO 50 • 30 sec. • f/18 • 24mm



I used a long exposure to convey a sense of motion, resulting in the smoothing effect on the water and the intentional blurring of the sailboats.

Maintenance and Good Habits

It pays to take care of your gear. Lenses are investments and deserve to be treated as such. From the photography student to the seasoned professional, those who take care of their lenses get the most mileage out of them.

Cleaning

Lenses get dirty. Keep them clean. It's as simple as that. Lenses collect dust, and even mud when you stumble down a 12-foot-deep pipeline ditch (**Figure 8.1**). Do you have a lens that grinds a bit when you turn the zoom or focusing rings? If so, there is dust or sand inside those particular mechanisms.

ISO 400 • 1/6400 sec. • f/2.8 • 24mm

Figure 8.1 To get this shot, I slid down the embankment on my backside, dragging cameras and lenses in the dirt with me, necessitating a thorough cleaning after the shoot!

Cleaning cloths

A proper cleaning cloth for any lens is made of microfiber and large enough to cover more than just the lens element. You can pick one up at every camera or electronics store. Just make sure it is indeed for camera lenses. Microfiber (**Figure 8.2**) is incredibly soft, does not scratch the glass or important coatings on the outside of the elements, and is a magnet for dust. I recommend getting one at least the size of your hand so you don't leave a thumbprint on the glass. Your fingers are especially oily, and when they come in contact with lens elements, try to clean the lens as soon as you can. A soft cotton T-shirt will also work. *Never* use anything polyester based, or tissues or paper towels.

Figure 8.2 Microfiber cloths are extremely lightweight and not abrasive to lens glass. I like to keep a few Spudz cloths attached to my camera bags.

Before wiping with a cloth, be sure the glass is free of any sand or other abrasive elements that can scratch the glass. Use a fine lens brush or air blower. With your cloth, wipe your lens's glass in a circular motion, paying extra attention to the area where glass meets the lens construction (the edge of the element). Wipe both outer elements, being extremely careful not to touch either with your fingers, especially the rear element nearest the camera (this one gets tough to clean if it needs any more than just a blow of air and a wipe).

If you need to clean a dusty lens barrel, a lens cloth will work. However, if there are large chunks of dirt or mud (or any sticky material) on the barrel, dampen a normal cleaning cloth and use it to lightly loosen all of the grime. Make sure to wring the cloth out very well before using, lest you get water in the seams and seals around the zoom and/or focus rings and buttons. Keep in mind that this is just for the barrel. If you want to apply a cleaning solution to the front and rear elements, I suggest you use an optic-grade product.

Solutions

At times, using a cleaning solution to wipe up grimier spots on lens elements is essential. Use a methyl alcohol solution when cleaning your lens elements. It is best to dampen your lens cloth with a few drops of it and then wipe instead of applying the solution directly to your glass. This reduces the risk of liquid seeping in through the seam of the lens barrel and glass construction. Take your time and wipe gently. Applying too much pressure may cause some unseen obstruction to scratch the glass, or at the very least the coatings necessary for great color and contrast rendering. If you do not have any solution at the time you notice grime on your lens, you can also breathe softly on the glass, fogging it up, and then wipe gently.

Air blowers

It seems I have an air blower in every camera bag. I believe an air blower should never be too far out of reach for both camera bodies and lenses. There are several brands of air blowers, but I lean toward the Giottos Rocket Air Blaster because of its durable, rubberized construction and force (**Figure 8.3**). Although they seem more useful for cleaning camera sensors, air blowers are nice for blowing large pieces of dust off of lens elements, as well as blowing grime away from seams and buttons. As if you were cleaning the digital sensor on your camera, hold the surface you are blowing upside down so debris clinging to your lens will fall away from it (**Figure 8.4**).

Figure 8.3 A rubber air blower, such as the Giottos Rocket Air Blaster, is an indispensable accessory.

Figure 8.4 **When using an air blower on your lenses, turn the surface upside down and blow upward, ensuring any debris on the glass or barrel falls to the ground.**

When I do a thorough cleaning of all my gear, I use the air blower to knock the first layer of dust off. I often use the air blower in place of a soft lens brush. I never—and nor should you—use canned air to clean any of my gear, especially my lenses and camera sensors. Canned, or compressed, air often spits and spurts fluorocarbons onto your gear, and the last thing you want is some of this leaking into your lenses. You may never be able to get it out.

Storage

I cringe at how some of my students store their camera gear, haphazardly thrown into backpacks or slung low and loose around the body. I need to stress the importance of storage. There are always going to be instances when you don't treat your gear with the utmost care, but hopefully this is when you're in pursuit of making great images instead of just transporting the gear around town.

Choose the right bag

Bags are a touchy subject among photographers. Many of us have our favorite brands (mine is Think Tank Photo), we have different functional requirements, and we want bags to have just a little style. Regardless of your brand preference, I suggest that you really examine the structure of a bag before you purchase. If you are lucky enough to have a camera store in your city, pay it a visit and compare bags of different makes and price points.

Although lightweight, bags with thin, almost paperlike, internal dividers are not very protective. Nearly all camera bags these days come with moveable dividers, and some even come with extra dividers. It is nice to have a bag that can be configured to your needs yet keeps your gear secure in case of a fall (**Figure 8.5**).

Figure 8.5 Ensure your camera bag has sufficient padding for transporting your lenses. This Think Tank StreetWalker Hard-Drive has thick but lightweight dividers. (I "Frankensteined" it with a couple of Lowepro dividers as well.)

Also compare the bags' zippers. One of the reasons I use Think Tank Photo is that they use sturdy zippers (**Figure 8.6**). The last thing I need is a zipper busting loose on my backpack, especially when it's full of equipment and on my back.

Figure 8.6 They might seem unimportant, but stout, big zippers are one of my first considerations when shopping for new bags. You do not want your zippers failing when you are transporting your bag or accessing the gear inside.

If you are an outdoors photographer, consider getting a bag that has water-resistant or waterproof exterior features, such as special cloth materials, zippers, and covers (**Figure 8.7**). I often use a Lowepro Pro Trekker when taking long hikes with a lot of gear due to its superior internal padding and water-resistant zipper for the main compartment (**Figure 8.8**). Take it from someone who has dunked a camera bag full of gear in a river: This is a feature you want.

Figure 8.7 When shopping for a bag to transport your gear, make sure it comes with a rain cover.

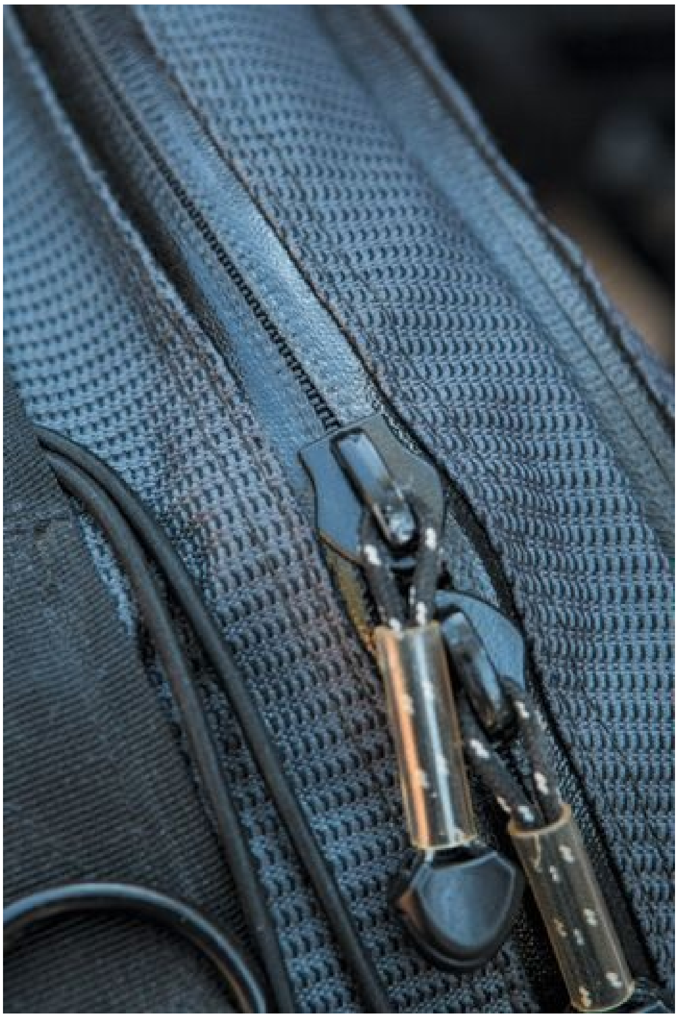


Figure 8.8 Many bags, including this Lowepro Pro Trekker, have water-resistant zippers. If you are photographing near or on water quite a bit, this is a valuable asset.

Some lenses come in their own bags. These are nice for transport when you need to pack a lens in luggage, insulating it from other noncamera gear. However, they are not all that practical when you also own a good camera bag with internal dividers. (I never use the bags that come with my lenses.) The large telephotos come packaged in their own hard-shell cases, but most photographers will acquire bags to transport these lenses more efficiently. The bottom line is there are many camera gear bags out there. Shop for durability, protection, and comfort (in that order).

Leave the lens on

I often see beginning photographers finish a shoot and then take their lens off their camera, put the body cap on the camera and the rear lens cap on the lens, and then put both in their bag separately. Some bags are designed to carry your gear like this, minimizing space needed for the bag itself (like the Think Tank Photo Shape Shifter in Figure 8.9). For the most part, I recommend keeping a lens on a camera. Why? Simply to keep the inside of the camera and the rear element of the lens cleaner. Every time you remove your lens from the camera, you invite dust to collect inside both pieces of gear. Clearly, you'll need to change lenses, but limiting the number of times you do it reduces the chances of debris collecting on the camera's sensor or rear lens element.

Figure 8.9 The Think Tank Photo Shape Shifter is a wonderful bag, but it doesn't allow the camera and lens to stay connected during transportation.

As an aside, it is also important to turn off your camera when changing lenses or taking one off to store the equipment. Leaving the camera on attracts static-friendly dust. Along the same lines, it is best practice to keep the camera facing downward when changing lenses.

Keep the lens cap on

One of the worst things you can do is lose a lens cap, a simple necessity (**Figure 8.10**). The lens cap is the number-one defense against fingerprint smears and small scratches. You might not need it when just photo walking around the city or out in the countryside, especially if you are using a lens hood, but it never hurts to put the cap on when you are hiking around rocky areas or stopping at the local pub for a pint.

Figure 8.10 Keep your lens caps close. They are the first defense against nicks, scratches, and grimy fingers.

Be sure to store your lens with the cap on. Most camera bags are constructed with internal materials that will not hurt your outer lens elements, but that doesn't keep you from putting in things (such as loose change) that might. Also, always remember where you put your lens cap. Every time I take off a lens cap, I put it in a pocket, usually my back pocket. I know that when it's time to return the lens back to the bag, the lens cap is somewhere on my body.

Reverse Your Carrying Position

My buddy Alan Hess gave me a good tip about carrying cameras. Alan is a fantastic live-event photographer, and he works in a variety of fast-paced environments, usually with one camera in hand and the other hanging on his shoulder. He slings his camera and lens on his shoulder with the lens pointed in toward his body. Most people sling their cameras with the lens pointed out and the camera's LCD screen against the body (Figure 8.11). However, reversing this position reduces how much the camera protrudes from the photographer's side. The lens will point down the photographer's leg instead of out (Figure 8.12). This position decreases the chance of the lens banging into objects.

Figure 8.11 **Slinging a camera on your shoulder with the LCD facing your body leaves the lens protruding from your side, making it prone to knocks.**

Figure 8.12 **Reversing the sling position keeps the lens (and LCD) close to the body.**

Say no to the car

I'm going to be very blunt: Do not store your camera equipment in the car. Unfortunately, I know several people who have had their gear stolen. Vehicles are just too easy to break into, and it's difficult to hide camera gear. If you live in a hot area, cars can become ovens as well. Although I don't know of any instances when the heat of a parked car damaged gear, I can't stand the idea of gear composed of silicon, glass, plastic, and glue sweltering in a hot vehicle.

So, what is the alternative if you have to leave your vehicle somewhere for a while? Carry your gear with you. Practice good judgment about your surroundings, but for the most part, you should just schlep your gear around.

Shooting Equipment and Techniques

When it comes to actually shooting with your lenses, the process seems pretty simple: Point the lens at what you want to capture, compose the shot, and snap. However, there is more to it, particularly in regard to maintaining focus and moving it with your subject matter (when shooting active subjects). Previous chapters discussed strategies and accessories for capturing great images with various types of lenses. The following section includes additional tips and suggestions for all lenses.

The Lens Hood

Part protector, part shooting necessity, the lens hood is the sister to the lens cap. Whereas all lenses come with lens caps, not all are packaged with a lens hood. I suggest getting a hood for every lens, for a number of reasons (**Figure 8.13**).

Figure 8.13 As bulky as some lens hoods are, like this one for the AF-S Nikkor 24–70mm f/2.8G ED, a hood does more than just reduce the potential for flare. It is also a great shock absorber and lens guard.

Lens flare

Most people associate a lens hood with reducing lens flare. Lens flare is caused by direct light—mostly sunlight, but anything with a high-intensity spot characteristic—hitting the lens elements at extreme angles. Photographers whose work involves turning their lenses in the direction of the sun deal with flare most often. Flare creates visible spots (or artifacts) or a global haze in a shot. A lens hood helps reduce flare simply because it provides a shade to block the sunlight. Lens hoods range in size. Make sure you get one manufactured specifically for the lens on which you wish to use it; otherwise, the hood may show up in the frame!

Shock absorber

I use a lens hood every time I shoot mostly because it provides the lens (and camera) with a great shock absorber. A lens hood is round, protrudes from the end of the lens, has a wider circumference than the lens itself, and is made of strong plastic with a little bounce in it. I once dropped a camera and lens from the seat of an 18-wheeler truck, and because it landed first on the lens hood, the only damage was a scuff on the side of the lens hood. Don’t worry if the hood gets a few scratches or dings.

Shooting in the wind

As much as I love its simple functions, the lens hood is relatively worthless in high winds, especially when you need to shoot into those winds. The hood is basically a cup at the end of your lens, and it catches direct and cross winds like a sail. Whether you are handholding a shot or making one from a tripod, wind blowing hard against a lens hood can vibrate and destabilize a shot. Certainly, the faster the shutter speed, the more able you are to make a focused shot, but it may not be possible.

When shooting long exposures, the effect of the wind is amplified (**Figure 8.14**). During these times, simply take the hood off. The lens may still catch a little wind but not nearly as much.

ISO 800 • 15 sec. • f/2.8 • 52mm

Figure 8.14 The wind was blowing so hard that the lens hood was like a small wind sail that shook the camera during the long exposure and knocked previous shots out of focus.

Vibration Reduction

Vibration Reduction (VR) is usually found on long prime lenses or zoom lenses that reach out past 100mm. However, the technology has trickled down into more standard zoom lenses as well. (You won’t see too many wide-angle lenses with Vibration Reduction.) As mentioned in Chapter 1, Nikkor’s Vibration Reduction (on VR II models) can offer up to four stops of stabilization (**Figure 8.15**).

Figure 8.15 Nikkor lenses that feature Vibration Reduction (VR) can offer up to four stops of motion-caused blur reduction.

Sports and wildlife photographers, event photographers, and many others who shoot in dimly lit environments find Vibration Reduction a lifesaver when using slow shutter speeds without a tripod or monopod. Landscape photographers, on the other hand, might have Vibration Reduction-equipped lenses but rarely engage the technology. Vibration Reduction is best used when there is a threat of your body's movement causing blur in your shots. VR excels when you shoot slower than your minimum sustaining shutter speed (**Figure 8.16**).

ISO 1600 • 1/60 sec. • f/4 • 300mm

Figure 8.16 For this image of photographer Jacob Copple and his subject, Vibration Reduction allowed me to shoot much slower than my minimum sustaining shutter speed for a 300mm lens.

Vibration Reduction Modes

Lenses that feature Vibration Reduction incorporate a system of reactive motion sensors, which feel the movement of a lens and attempt to counteract it to ensure a sharp photograph at slower-than-normal shutter speeds. Most lenses with the Vibration Reduction system have only one standard mode of VR (Normal), which is adapted for shooting static (nonmoving) subject matter. This type of vibration reduction accounts for minute vertical and horizontal movements of the lens and is ideal for shooting in low-light situations. It can often be employed in general shooting situations as well. The Normal VR mode is also useful when you are creating pan shots of subjects. VR helps correct vertical blur because the VR's Panning Detection takes into account the intentional horizontal blurring that comes with a typical pan shot.

Some lenses incorporate a second VR mode (Active) that is ideal for stabilizing shots not only when shutter speeds get too slow, but also when the photographer is moving or in an unstable position (**Figure 8.17**). For example, a photographer who has uneven footing for a landscape shot or needs to hold the camera away from her body to get a shot can use this mode to compensate for erratic movement. Photographers shooting from a moving vehicle (not recommended) can use this mode to stabilize the lens's optics for a sharp shot of a subject.

Figure 8.17 Switching between Vibration Reduction modes (on select Nikkor lens models) is easy, especially while shooting.

A third Vibration Reduction mode (Tripod) can be found on only six lenses, all telephoto and all fairly expensive (the AF-S Nikkor 400mm f/2.8G ED VR, the AF-S Nikkor 500mm f/4G ED VR, the AF-S Nikkor 600mm f/4G ED VR, the AF-S Nikkor 200mm f/2G ED VR II, the AF-S Nikkor 300mm f/2.8G ED VR II, and the AF-S Nikkor 200-400mm f/4G ED VR II). The latter three include the technology but not a specific Tripod mode switch. The Tripod mode takes into consideration and reduces the amplifying effect a tripod can have on a shutter or mirror movement in the camera. It is ideal for those lenses—particularly the 400mm, 500mm, and 600mm mentioned above—that are used extensively on tripods.

Vibration Reduction also comes in handy when you are photographing in dark environments, with apertures closed down past maximum (**Figure 8.18**). Keep in mind, VR only helps you handhold slower shutter speeds. It has nothing to do with freezing the movement of your subject.

ISO 3200 • 1/50 sec. • f/4 • 300mm

Figure 8.18 Live theatrical and music performances with dim lighting are perfect subjects for activating Vibration Reduction.

When shooting with fast shutter speeds for the lens you are holding, it might be best to disengage Vibration Reduction (**Figure 8.19**). For example, let's say you are handholding a 300mm focal length and shooting with a shutter speed of 1/640 of a second. More than likely, this is fast enough to handhold without using Vibration Reduction. If engaged, VR may shift your composition a bit, and it can even drain your battery.

ISO 100 • 1/1600 sec. • f/2.8 • 400mm

Figure 8.19 **Sports events often take place in bright light, allowing shutter speeds fast enough to negate Vibration Reduction. In fact, VR may shift the image's composition.**

Likewise, if you are shooting from a tripod, Vibration Reduction can often do more damage than good. VR can slightly recompose a shot that was meticulously set up on a tripod. The optics may shift from where you originally intended the frame to be. With longer exposures on a tripod, the VR function may even cause blur based on the amount of movement it makes. The solution? Turn Vibration Reduction off when you put the camera on a tripod.

Tripods

The tripod—every photographer's best friend and worst enemy. Best friend because there's no better way to stabilize a camera and lens for a wide range of photographs. Worst enemy because it is such a pain in the posterior to carry around. Undoubtedly, the tripod is a worthy tool. There are a couple of lens-related considerations to keep in mind when shopping for and using tripods.

Construction

Whenever I'm asked for tripod suggestions, I always give the same advice: Look for sturdy legs and a sturdy head. Unfortunately, there are quite a few bad tripods out there on the market. For example, the drugstore variety of tripods—made of lower-grade aluminum with a plastic head and mount that is moved up and down with a small plastic crank—are inexpensive for a reason. They are not sturdy platforms, and I have seen more than one break in a river and float downstream.

Tripods should not be an afterthought. By shopping around and spending just a few more dollars, a photographer can get an extremely stable tripod that will last. There are a number of tripod brands. I recommend Manfrotto for aluminum and Gitzo for carbon fiber, but you should compare different models. A nice set of aluminum legs and a strong head can cost as little as US$200. Aluminum is heavier than carbon fiber but less expensive (although carbon fiber is coming down in price).

I also advise shopping for legs and heads separately (but looking at the combos or kits in case there is one that contains the legs and head you want). This forces you to analyze the legs separately from the head, making sure both will hold up to the weight of heavy lenses.

There are two ways to mount your camera or lens onto a tripod: by screwing the gear directly onto a ball head—my preference (**Figures 8.20** and **8.21**)—or using some version of a quick-release (QR) plate that is first attached to the camera or lens and then attached or detached from the tripod head (**Figures 8.22**, **8.23**, and **8.24**). Regardless of which type of mount you use, make sure it is metal. Plastic mounts are flimsy and break easily. This is especially true of plastic quick-release plates that mount into plastic heads. Metal mounts can stand under pressure as you tighten your gear to them, resulting in a much more stable platform for heavier lenses.

Figure 8.20 **A Manfrotto 486 Compact Ball Head is a simple but sturdy head, known for its ease of use and reliability.**

Figure 8.21 **Traditional ball heads screw right into the bottom of the camera or lens tripod collar, making for a secure, albeit somewhat inefficient platform on which to mount your gear.**

Figure 8.22 A quick-release (QR) tripod head, like this Gitzo Traveler version, is a popular style of head for photographers who need to work quickly.

Figure 8.23 **The QR plate screws into the tripod mount on any camera or lens collar.**

Figure 8.24 Make sure to test the sturdiness of the QR plate's connection to the head on any tripod for which you are shopping. QR plates have a habit of becoming loose over time.

The mounts that allow you to screw the head directly into the camera or lens are arguably the sturdiest. Although it takes longer to mount the camera and lens to the tripod, once it is there, it is essentially a part of the entire platform. Landscape photographers value this type of mount since they are on a tripod a large percentage of the time. I appreciate the efficiency of a quick-release plate—and often use one with one of my tripods—but the QR mount tends to wobble more than a direct mount to a ball head after some use.

The longer-lens shake

To reiterate a point from Chapter 5, the longer the lens (physical length), the less stable it is on a tripod. When using a telephoto lens, it is best if you mount it by its own tripod collar as opposed to mounting the camera to the tripod. Many telephoto lenses come with a tripod mount collar that can be used just like the mount on the bottom of the camera body (**Figure 8.25**). This results in a more balanced distribution of weight on the tripod.

Figure 8.25 If your heavy telephoto lens includes a tripod collar, use it to secure the lens to the tripod. Don't leave the weight of the lens hanging off the camera's much weaker lens mount.

A tripod mount collar also helps prevent the bounce that may occur when you mount a camera body attached to a long lens at the camera. The uneven, out-front weight of such a combo makes the head and camera body flex up and down, potentially bouncing a shot out of focus. Lenses that are not manufactured to mount with a collar, like the AF-S VR Zoom-Nikkor 70–300mm f/4.5–5.6G IF-ED, are not considered heavy enough to create such a drastic bounce or flex of the camera and tripod head. However, I have seen these relatively lightweight lenses become more unstable on cheap, drugstore-variety tripods—one more reason to consider a heavier set of legs and head.

For extremely long and heavy lenses—such as the AF-S Nikkor 400mm f/2.8E FL ED VR, the AF-S Nikkor 500mm f/4G ED VR, and longer—special gimbal heads are often necessary to take on the extreme weight as well as offer superior stabilization and mobilization (**Figure 8.26**). Wildlife and bird photographers are attracted to these types of heads for their fluid motion, ease of use with heavier lenses, and quality construction. Some tripod and gimbal head setups do come at a price (they can cost into the thousands), but if you can afford to purchase a US$10,000+ lens, you will want to place it on the best platform possible.

Figure 8.26 Gimbal heads are able to support and efficiently move a very heavy, tripod-mounted telephoto lens, and they are popular with many wildlife photographers.

Going Solar

Who says not to include the sun in your shots? Well, me, for the most part. However, there are a few creative ways of making such a bright, overbearing light source work inside your frame.

Flare

Lens flare comes in two basic varieties: visible artifacts and haze. Flare is caused by pushing a lens's ability to focus light through its various lens elements. Many photographers are reluctant to include flare—especially artifacts—in their shots because of the potential negative impact on an image (**Figure 8.27**). Over the years, flare has become a bit cliché as well. However, sometimes it does have its purpose.

ISO 200 • 1/400 sec. • f/22 • 17mm

Figure 8.27 While attempting to capture a solar ring on an alpine hike in Tongariro National Park, New Zealand, I included a colorful yet annoying flare as a result of shooting directly into a cloud-covered sun.

Artifact flare can be used to stress extreme personality in a shot, as well as direct the eye to, or away from, something significant. Flare is sometimes used in sports shots and those expressing a characteristic of an environment, such as an oppressive desert climate or barren snowscape (**Figure 8.28**).

ISO 100 • 1/250 sec. • f/16 • 17mm

Figure 8.28 The flare in this shot, more of a starburst, coincides with the adventurous spirit of the hikers.

A haze effect is essentially one large flare artifact that covers an entire frame. A haze flare can often be an advantage, warming up an otherwise cool scene, and it is useful in toning a compressed, layered scene. Using haze flares is an aesthetic choice, but in my opinion, they work well in landscape photography (**Figure 8.29**). I have also seen them put to good use in portraiture (**Figure 8.30**).

ISO 100 • 1/400 sec. • f/2.8 • 175mm

Figure 8.29 **The subtle warmth of this Scottish countryside is due greatly in part to the late-evening flare covering the lens's entire angle of view.**

ISO 50 • 1/200 sec. • f/2.8 • 140mm

Figure 8.30 Although the subject is artificially lit, the warm haze that provides ambience to the shot is actually an encompassing flare caught late in the evening.

Starburst technique

There are starburst (or star, for short) filters that make every specular light in a frame shine like a star, but you can also create a starburst with the sun, a subject, and a lens (**Figure 8.31**).

ISO 200 • 1/100 sec. • f/18 • 14mm

Figure 8.31 With a stopped-down aperture and subject matter obstructing the sun, a pristine starburst is but a shutter-click away.

The process is fairly simple. Find a subject and composition in which you would like to have a starburst accent the scene. The sun must be in the shot, so you will likely be shooting directly into it. The catch is to block much of the sun with the subject matter, such as a tree. Place the sun where branches meet the trunk of the tree or where they branch out even more, among the canopy. Let a bit of sun shine through to the lens right at the point where a branch meets another part of the tree at an angle.

This is where the lens comes into play. Set your aperture to f/8 or higher. This will help focus the sunlight and shape it into what looks like a multipoint starburst. The more closed down the aperture, the more focused the starburst; if the aperture is set wide open, the burst may be indistinguishable. It might take you a few shots to get it the way you want. Be careful not to employ this technique too much if you are shooting editorial work, for risk of being repetitious.

Shooting at Night

At night, light is a major consideration, especially how the light from sources not “on” during the day, such as stars, will look in your frame. You will need to expose for longer periods of time and/or turn up the ISO to capture light more quickly.

One important tip for using lenses at night: Get the shot set up before the light is gone. For example, you might have a great night shot set up among the stars with a bit of the horizon in it and some structure on the ground that you want the small amount of light to expose while the shutter is open. If it gets too dark before you set up, focusing where you want will be very difficult, given that focus works by detecting contrast in light values. If the focus sensor cannot detect an edge of a subject or the horizon, it makes an educated guess.

The following are a couple more tips for when you're working the lens at night. Note that these have more to do with long exposures than anything else, and some of these issues have already been covered.

Which aperture?

Light at night is obviously dim compared to light during the day. Therefore, it is typical to leave the aperture more open than closed when shooting at night, especially if the night sky is your subject.

Stars are extremely dim to the camera's sensor, simply because they are so far away. They may be very powerful, but the distance knocks their intensity out. I start my night sky exposures using an aperture of f/4 or f/5.6. This is particularly fitting for when I want to do extremely long exposures of over 5 minutes (**Figure 8.32**). At an ISO of 100, f/5.6 is open enough to let in a nice amount of starlight but closed down enough that over a long exposure the stars do not burn too long in one spot. However, it is worth knowing that the more closed down the aperture, the dimmer the overall exposure will be, especially the star trails.

ISO 100 • 31 min • f/4 • 17mm

Figure 8.32 Star trails are usually accomplished with a low ISO, a very long exposure (in excess of 5 minutes for long trails), and an aperture that is not completely wide open. Don't forget a tripod!

If you want to go for those shots that expose the stars exactly where they are in the sky, instead of star trails, open up your aperture all the way, crank your ISO up, and shoot for around 30 seconds. I really enjoy lenses that open up to f/2.8 for this application, but f/3.5 is great as well. The key is to let in as much light as possible during that 30 seconds and burn the stars on the sensor before the earth rotates enough for trails to be created. That's why the ISO is cranked high and the aperture wide open (**Figure 8.33**). Keep in mind that if there is any light near the horizon on which you are pointing, like the residue of a sunset or a city off in the distance, it will register more quickly using this technique.

ISO 1600 • 20 sec. • f/4 • 14mm

Figure 8.33 Capture the abundant night sky with a high ISO and an open aperture. Make sure to get out of town into dark-sky country, and set up before the sun goes down to avoid fumbling around for composition in the dark.

Distortion and the night sky

If you're like me, you enjoy those wide-angle, expansive shots of the night sky. When just shooting the stars as they stand with high ISO and wide-open aperture, the distortion the lens creates is rarely recognizable, aside from any subject matter you might have composed in the foreground, such as a mountain or tower.

However, something very interesting happens when you point a wide-angle lens high into the night sky and shoot a long exposure (something long enough to render star trails, like 5 to 10 minutes). This setup may result in trails that arc like a rainbow and *another* set of trails that arc in a reverse rainbow above the aforementioned trails (**Figure 8.34**). This usually occurs with ultra-wide-angle focal lengths, such as 14mm. The double arc of trails is the result of the extreme curvature of the lens, where one set of trails curves away from the midpoint toward the horizon and one curves the other way. If the second arc of trails bothers you, angle the lens farther down toward the horizon, reducing the presence of this second arc.

ISO 100 • 28.5 min. • f/4 • 14mm

Figure 8.34 With an ultra-wide-angle lens pointed far enough up on a night sky, a long exposure will produce two arcs of star trails.

Pay Attention to Those Before You

It is important to keep our eyes and ears open to practices that will help us create better images and make sure our gear lasts for the long haul (like my tip from Alan Hess about how to carry your camera and lens when they're slung across your shoulder). A great deal of information exists on the Internet in regard to maintaining and operating your equipment, but I advise you to also find someone local who has been shooting for some time (maybe a professional, maybe an experienced amateur or teacher) and form a relationship. Not only will you be creating community around your craft and passion, but you will also be gaining a resource for questions you have along the way.

Be open to discussion about some of the issues posed in this book. Everyone operates a bit differently, and you never know what you are going to learn. I know a wildlife photographer who adds ankle weights to lighter-weight telephoto lenses to stabilize them when he is handholding a shot. I never would have thought of that, but it makes sense. Through a relationship with an experienced photographer, you will always be able to glean best practices that might help you in your own image making.

Chapter 8 Assignments

Taking care of your lenses is essential. So is using them in ways that make for the best photographs. The first assignment highlights the importance of keeping your gear clean and operable. The second is a useful but often intimidating technique to perform when shooting with any lens.

Treat your lenses with care

Assess how you handle your lenses (and all of your gear, for that matter). Is it with care, or are you lax about wear and tear? Do you have the standard accessories for keeping your gear clean? This is a good time to take inventory. If you do not already own them, acquire a lens microfiber cloth, a reputable lens-cleaning solution, and an air blower (not compressed air).

Learn how to use them all. Ask your local camera-store representative to show you how to use each of the items, or lean on online resources, like B&H Photo, for proper care of your glass. Institute a regularly scheduled cleaning (either after every shoot or once a week if the shooting has been light or in clean environments).

Create a starburst

Making starbursts is fun, creative, and easy to accomplish. If you have never performed this technique, start on something small, like a backyard tree. Wait until late evening (or get up early) when the sun is closer to the horizon. Position the tree between you and the sun, and focus on its branches. Put the entire tree in the frame, or select a portion of its branches for your composition. Expose for the sky behind the tree, forcing you to silhouette the tree. Stop your aperture down to somewhere around f/11 or f/16.

The tricky part is placing the sun slightly behind a branch and slightly exposed to the lens. Use your Depth of Field Preview button to stop down your aperture while looking through the viewfinder, and as you position the sun behind parts of the tree, you should be able to see it burst as a star in your frame. Where it bursts is where you want it positioned. Typically, the more you stop down your aperture, the more focused the star becomes. Practice this at home, and then use walls of buildings in cities, water towers, mountains, even flowers! I can’t say starburst shots are in high demand, but they are certainly fun to make.

Share your results with the book’s Flickr group!
Join the group here: www.flickr.com/groups/nikonlenses_fromsnapshotstogreatshots

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9. Postprocessing

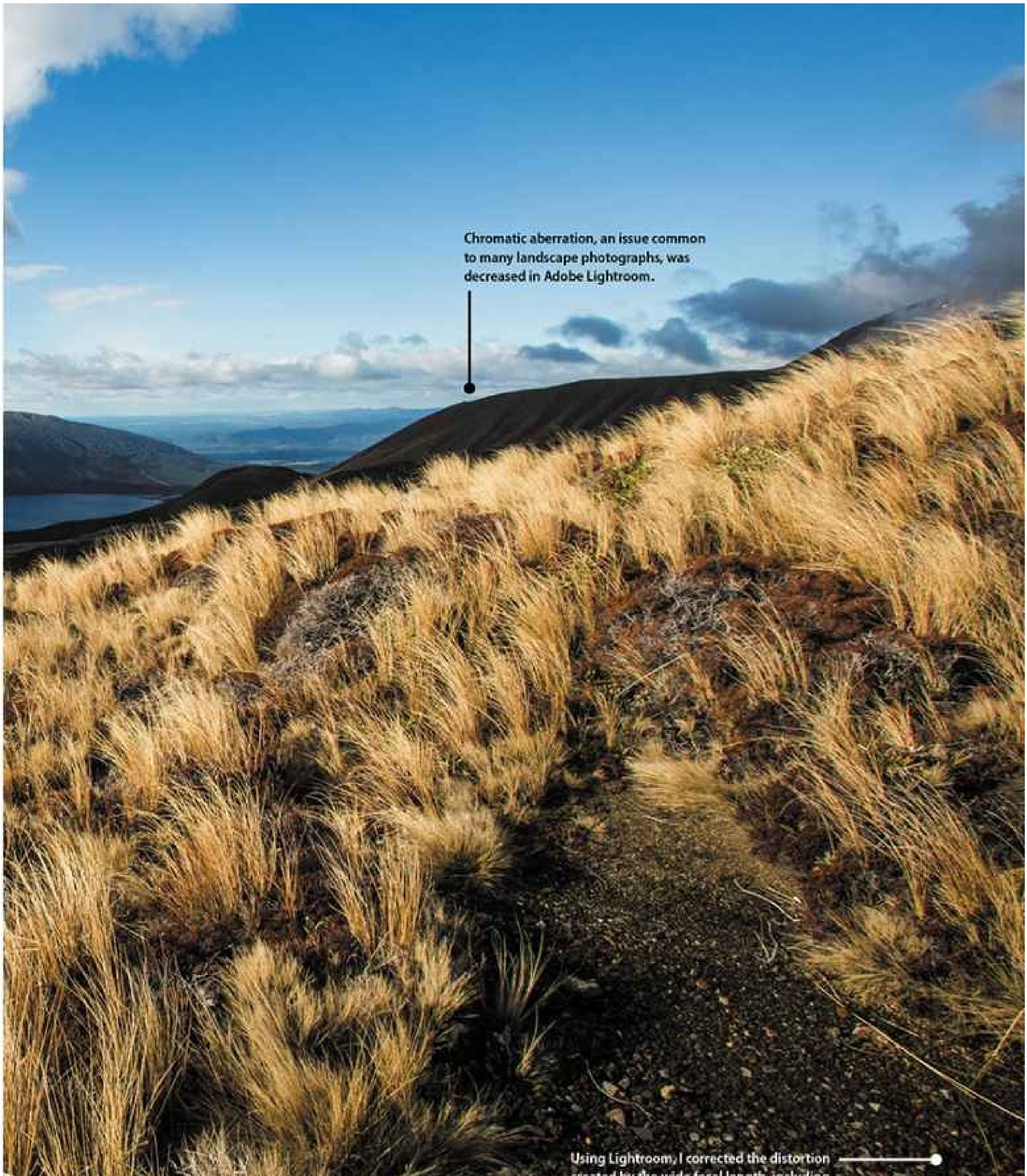
ISO 100 • 1/400 sec. • f/8 • 17mm

Minimizing lens flaws

Nikon lenses are not perfect. Barrel distortion, lens vignettes, sensitivity to flare—in some ways, we are still dealing with the same issues photographers noticed a couple of decades ago (mostly because many lens models are not updated very often). Some photographers enjoy the inherent flaws a lens exhibits in a frame. These imperfections can be very stylistic. Other lens characteristics can be a nuisance, or at least something worth correcting using postprocessing software. Following are a few issues that make themselves visually known in the frame and tips on how to mitigate their effect with the aid of Adobe Photoshop Lightroom, one of many postprocessing software applications.

Poring Over the Picture

ISO 100 • 1/80 sec. • f/16 • 17mm


Chromatic aberration, an issue common to many landscape photographs, was decreased in Adobe Lightroom.
Using Lightroom, I corrected the distortion created by the wide focal length, including the vignetting in the corners of the frame.

Lens Distortion

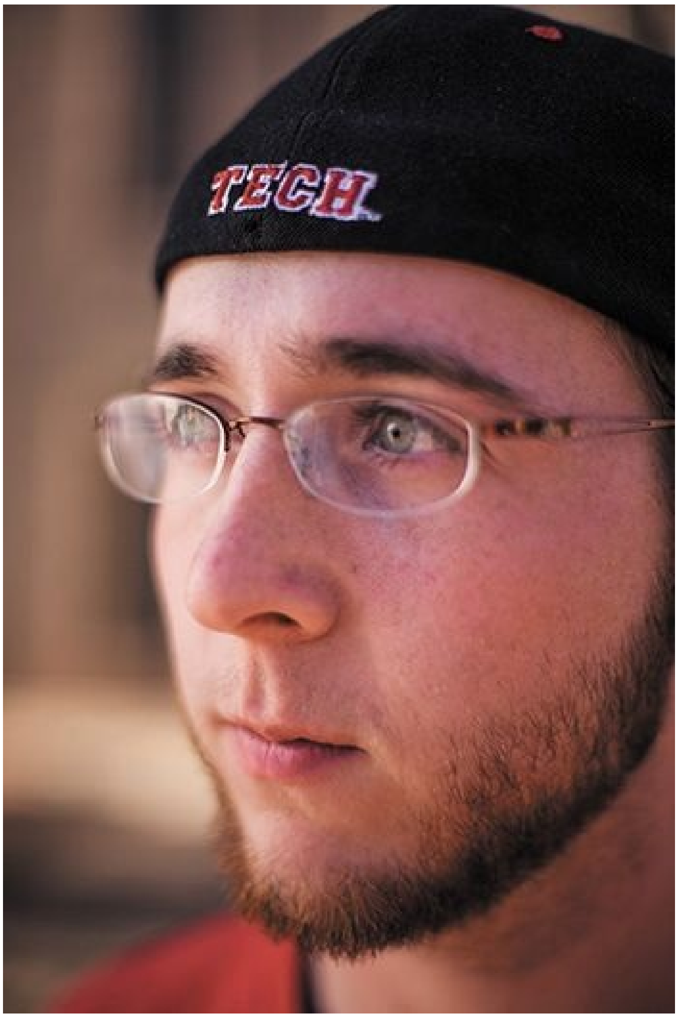
No matter how perfect you think your lens is, it more than likely has a bit of inherent distortion outside the obvious distortion that occurs with lenses like ultra-wide-angles. This distortion is a more subtle—and sometimes unnoticeable—result of the curvature of the various lens elements inside the lens barrel. In some cases, it's the result of the distance the lens is from the subject or where subject matter is placed in the frame's composition.

An example of this distortion can be found in ultra-wide focal lengths when a perfectly flat horizon placed below the midway point in the frame starts to curve upward at the edges of the frame (**Figure 9.1**).

ISO 200 • 1/1600 sec. • f/8 • 10mm

Figure 9.1 Wide-angle focal lengths often create an unwanted curvature of the horizon when it is pushed close to the edge of the frame.

If the horizon is placed in the lower third of the frame, it becomes a shallow bowl, and the opposite occurs if it is placed in the upper third. The closer the horizon is to the top or bottom of the frame, the more drastic the effect. Wide-angle zooms are especially prone to this distortion—often referred to as *barrel* distortion—as content in the frame becomes spherical. Of course, distortion is not only an issue for wide-angle lenses. Normal lenses, like the 50mm, pushed in tight on a face results in said face bulging out toward the viewer in a rather unflattering way (**Figure 9.2**). This is why the 50mm, although a great lens for editorial purposes, is not great for head shots.



ISO 200 • 1/2000 sec. • f/1.4 • 50mm

Figure 9.2 Pushed in too tight on a subject, a 50mm lens can cause a face to bulge.

Sometimes the effect is fairly miniscule, and sometimes it is glaringly obvious. Much of the noticeable distortion comes as a result of pushing the lens close in on a subject or composing subject matter near the edges of the frame. Fortunately, there is a way to fix this effect.

Lens Correction

In Lightroom's Develop module (**Figure 9.3**), you can engage the very powerful Adobe Camera Raw (ACR) image-processing engine. A significant, albeit small and often overlooked section of the Develop module is the Lens Corrections palette (**Figure 9.4**), below several palettes that are used for manual adjustments (Basic, Tone Curve, HSL/Color/B&W, Split Toning, and Detail). The Lens Corrections palette accesses several strong features of ACR that are useful for correcting general lens distortion. The two we are most concerned about are under the Profile and Manual tabs.

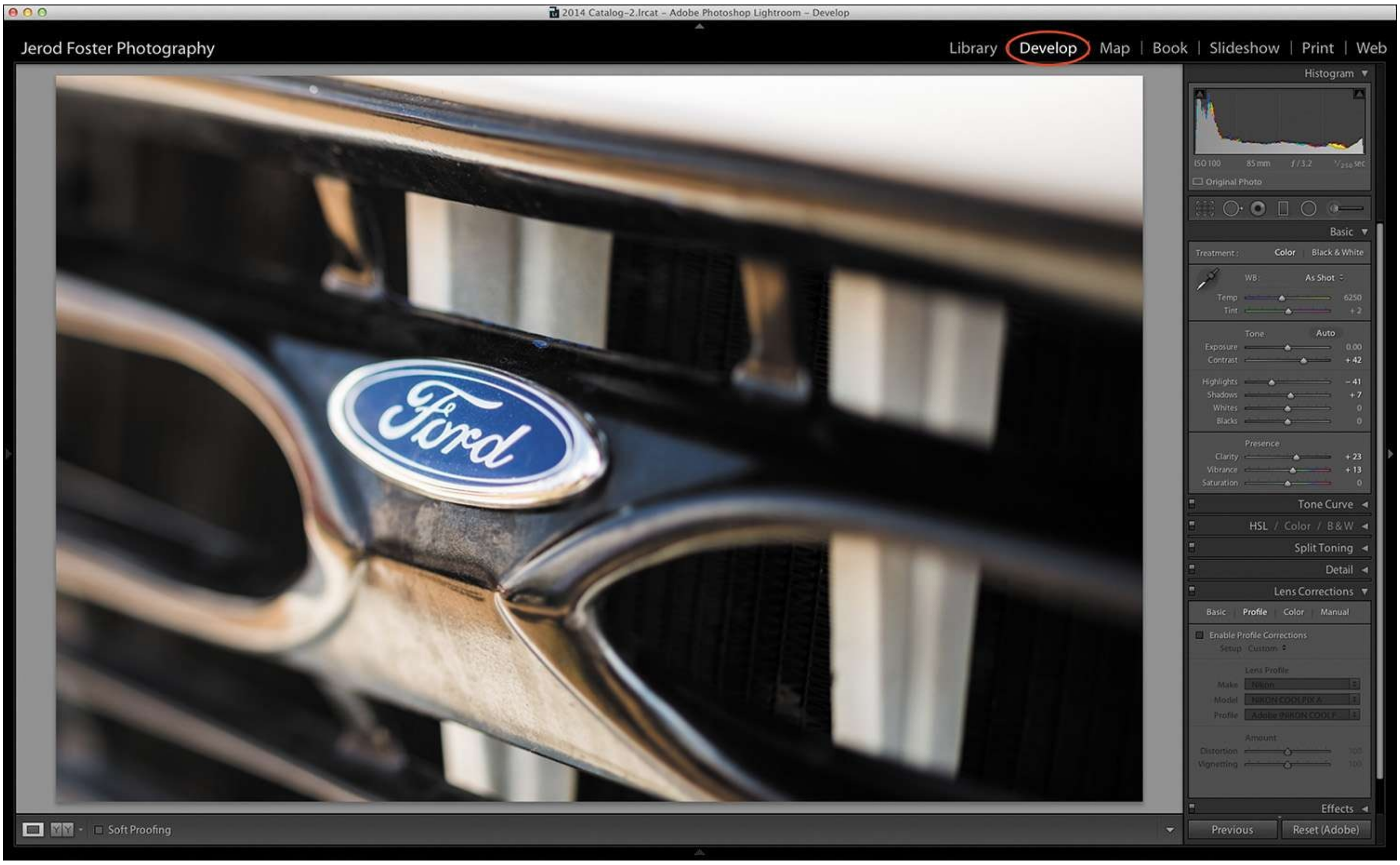


Figure 9.3 **The Develop module in Adobe Lightroom has a strong processing engine that offers not only basic processing features but also excellent correctional features for lens effects.**

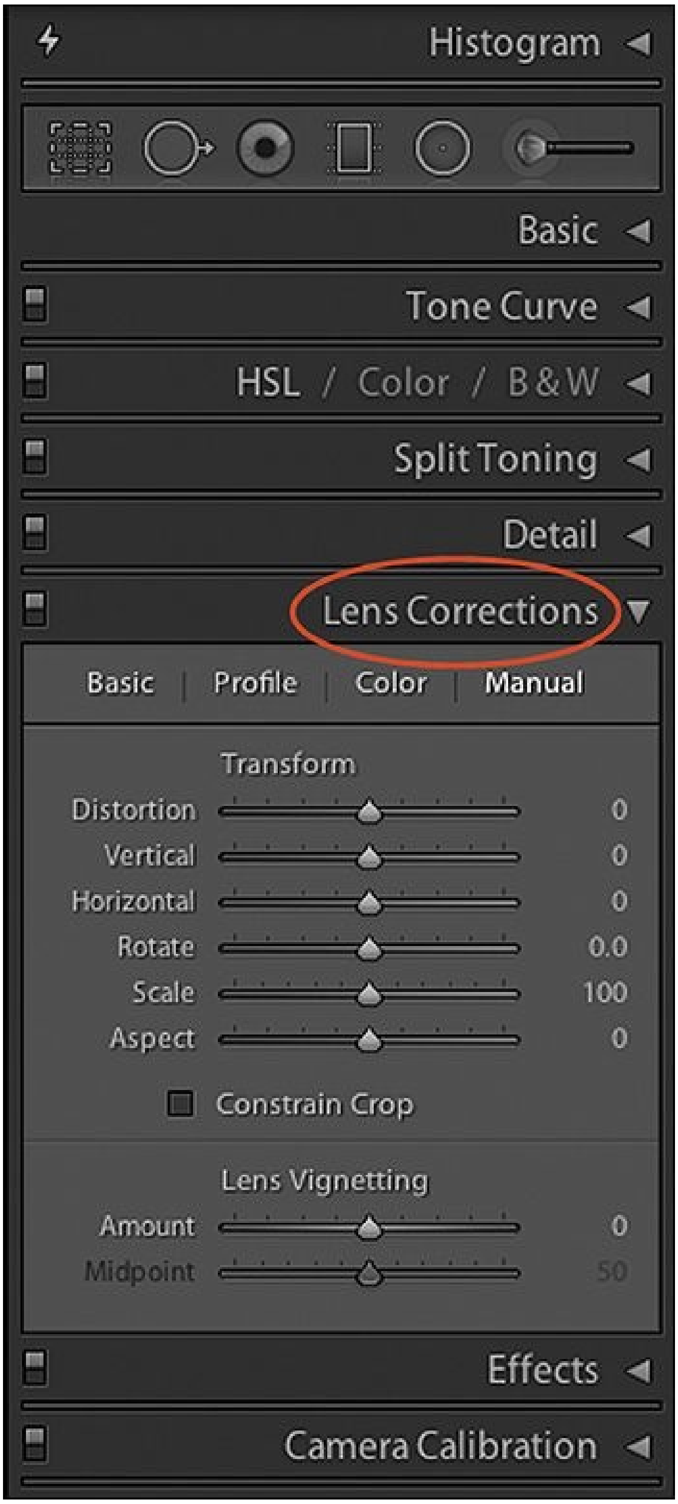


Figure 9.4 The Lens Corrections feature in Adobe Lightroom is highly effective in automatically and manually mitigating lens issues.

Under the Profile tab, you initially notice the adjustable fields are blanked out. If you feel that the image showcases a fair amount of distortion, simply check the Enable Profile Corrections button, and everything comes to life (**Figure 9.5**). Clicking this button enables Lightroom to automatically make correctional adjustments for you based on the make and model of the lens used for the shot. This information, called EXIF data, is embedded in the photograph on creation (**Figures 9.6** and **9.7**).

Figure 9.5 **Clicking the Enable Profile Corrections button activates automatic lens detection and automatic correction for distortion and other issues.**

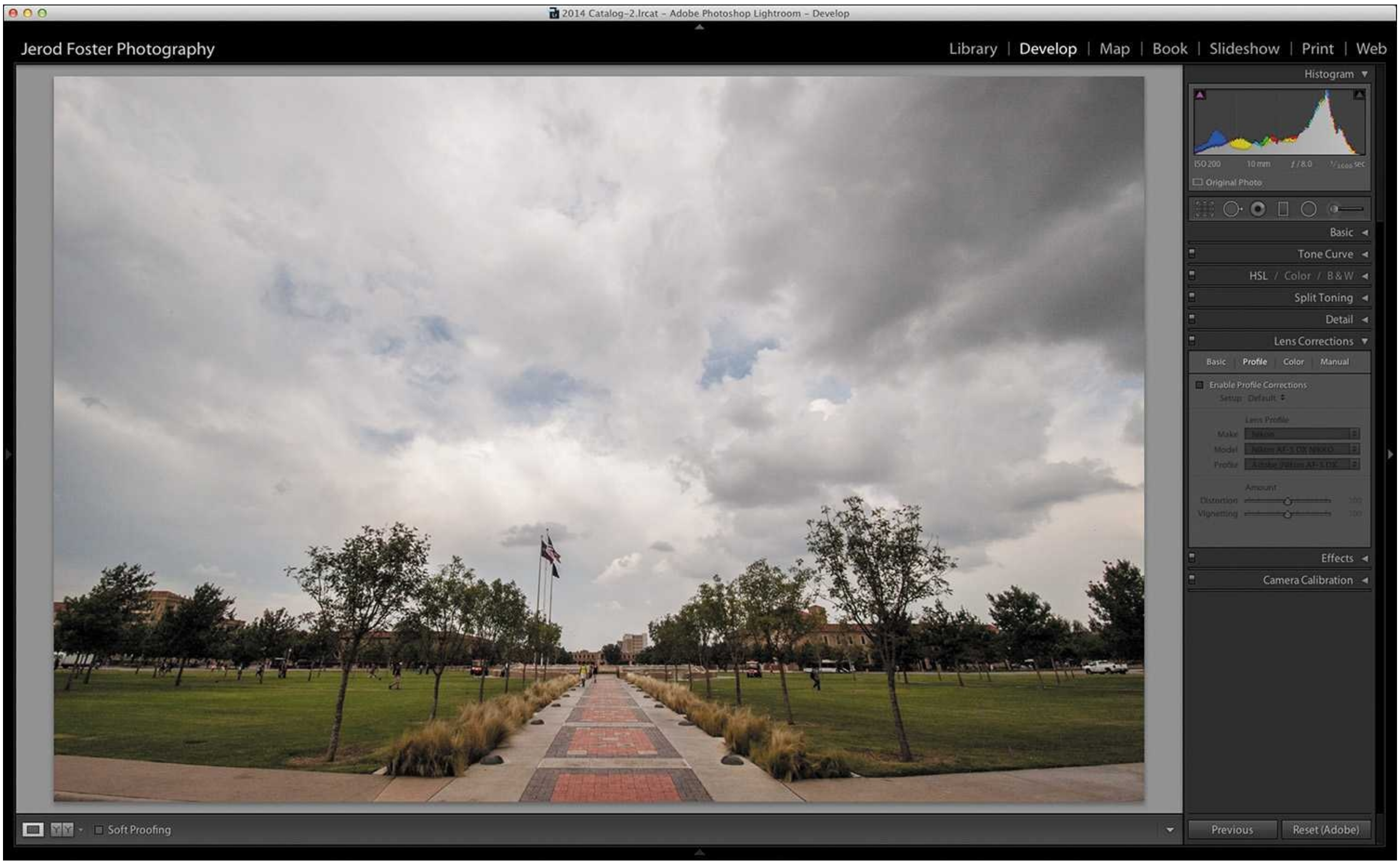


Figure 9.6 **Before I clicked on Enable Profile Corrections: The horizon line is curved downward due to the wide-angle distortion of the lens.**

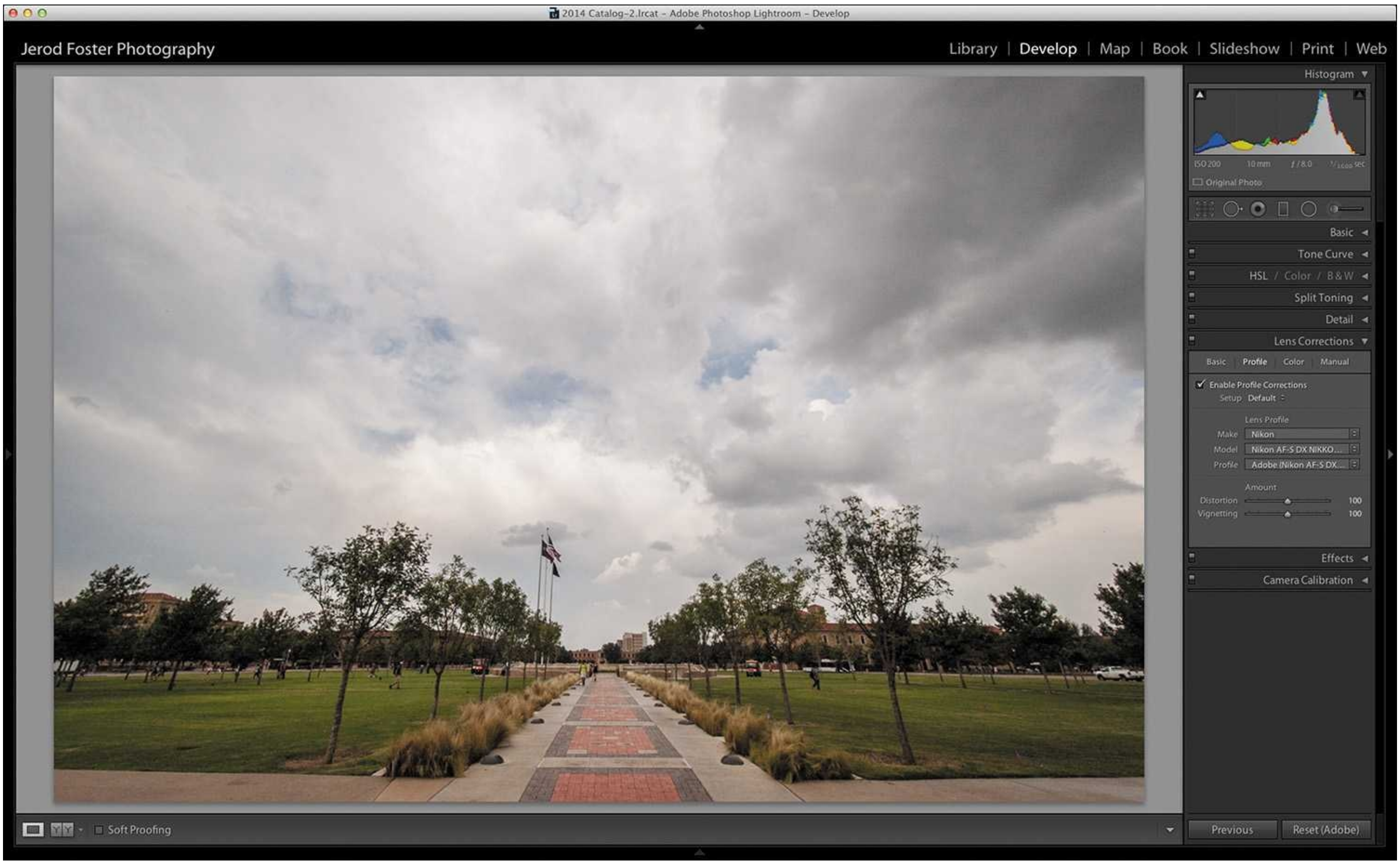


Figure 9.7 **After I clicked on Enable Profile Corrections: The function automatically detects the lens and quickly fixes the bowed horizon line.**

If you are using fairly new equipment, Lightroom does a great job of recognizing which lens you used for any individual shot, and you can pull down the Model list and switch lens profiles if you want. This large list of lenses contains correctional profiles for each Nikon lens in production as well as a few no longer being manufactured. The profiles are used to correct any distortion associated with the optics of each of these different lenses.

Interestingly enough, you can also change the make of the lens to a number of other lens manufacturers if you want to make an even more customized correction to the look of the image. You may also manually adjust the amount of distortion and vignetting for any profile used. The Distortion slider adjusts the amount of bulge or curvature of the image, while Lens Vignetting controls the darkening of the corners around the frame (common in many lenses).

The Manual tab contains more-tunable distortion and vignetting controls, as well as controls for vertical and horizontal adjustments (on-axis adjustments that seem to make the image tilt and/or turn), rotation adjustment, and scale and aspect ratio adjustments (**Figure 9.8**). Essentially, the Manual tab allows the user to bypass the Profile tab and go straight into handling the image on his own (**Figures 9.9**, **9.10**, and **9.11**).

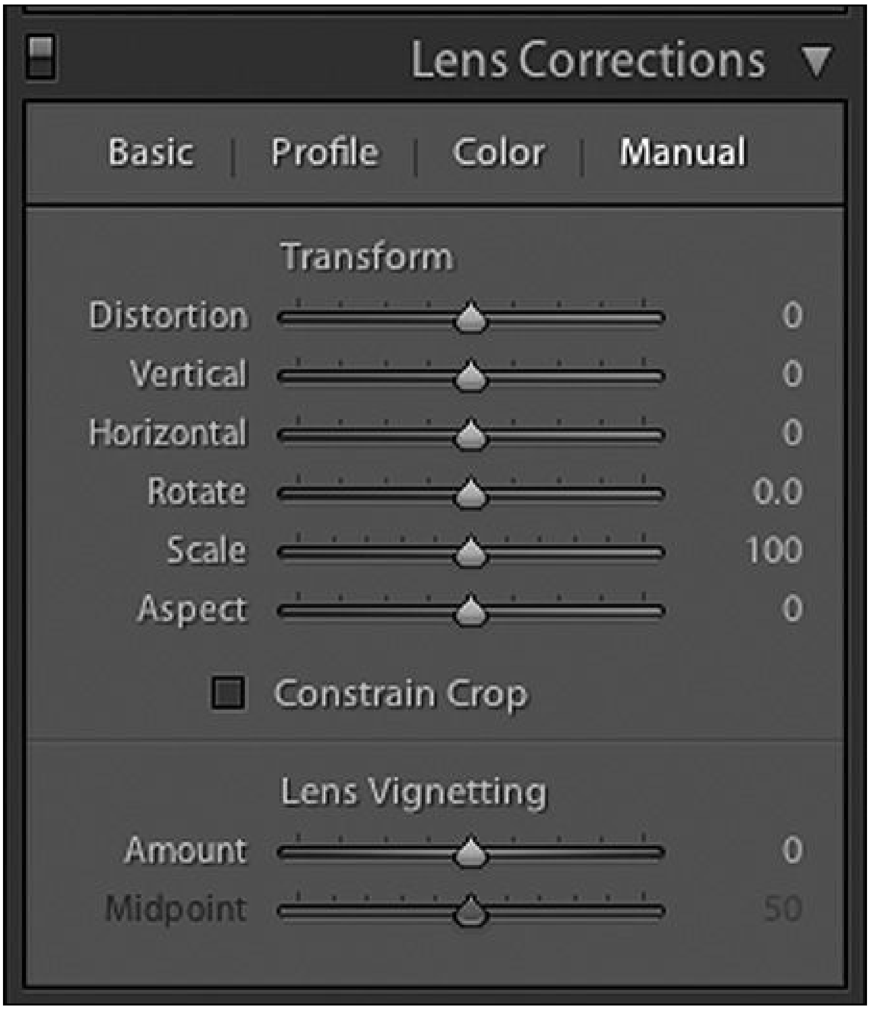


Figure 9.8 The Manual tab of the Lens Corrections palette bypasses the automatic features and allows the Adobe Lightroom user more control over the image's characteristics/flaws.

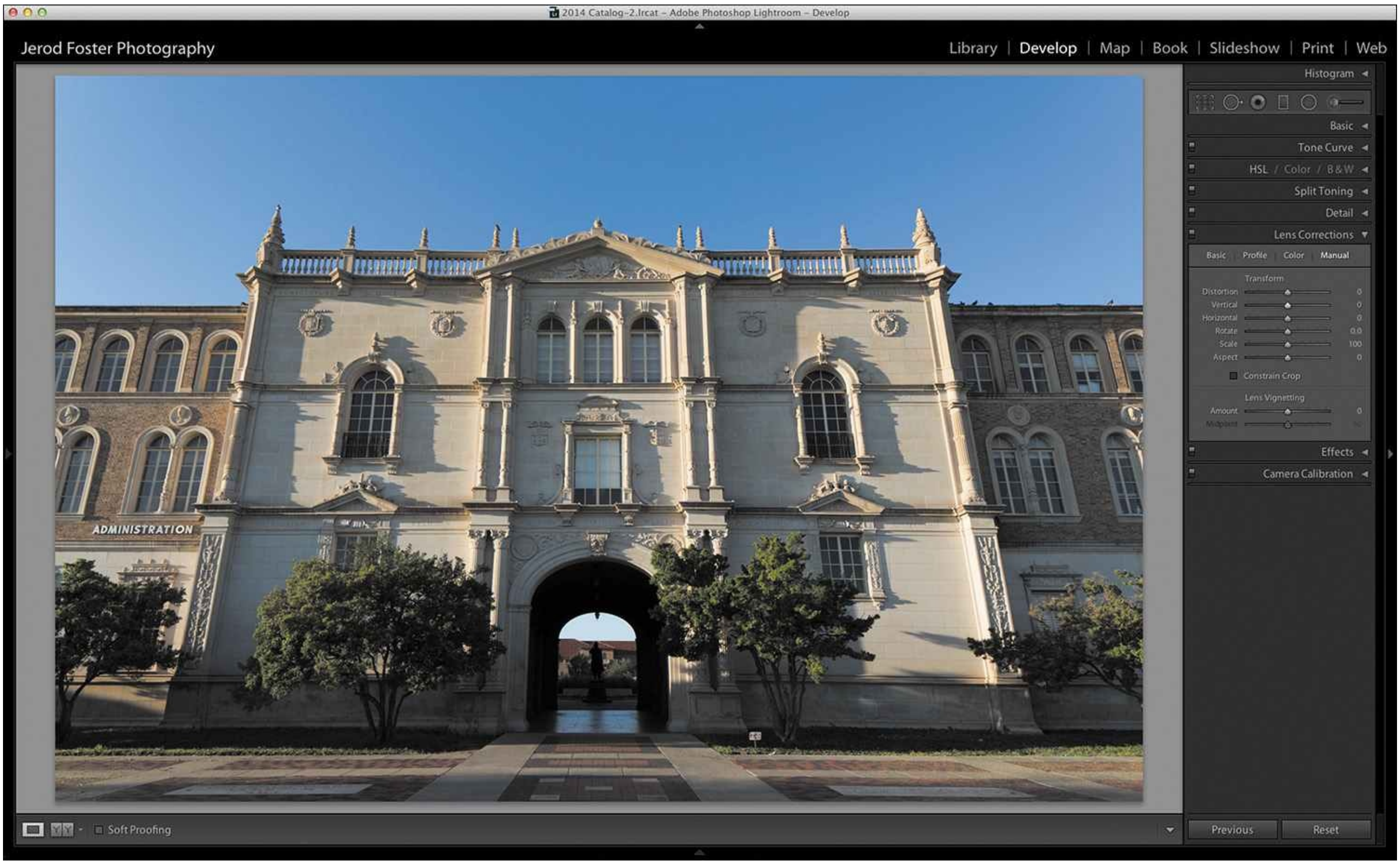


Figure 9.9 **The Manual tab is a critical tool for correcting keystoning, especially when a tilt-shift lens is not available for the shoot.**

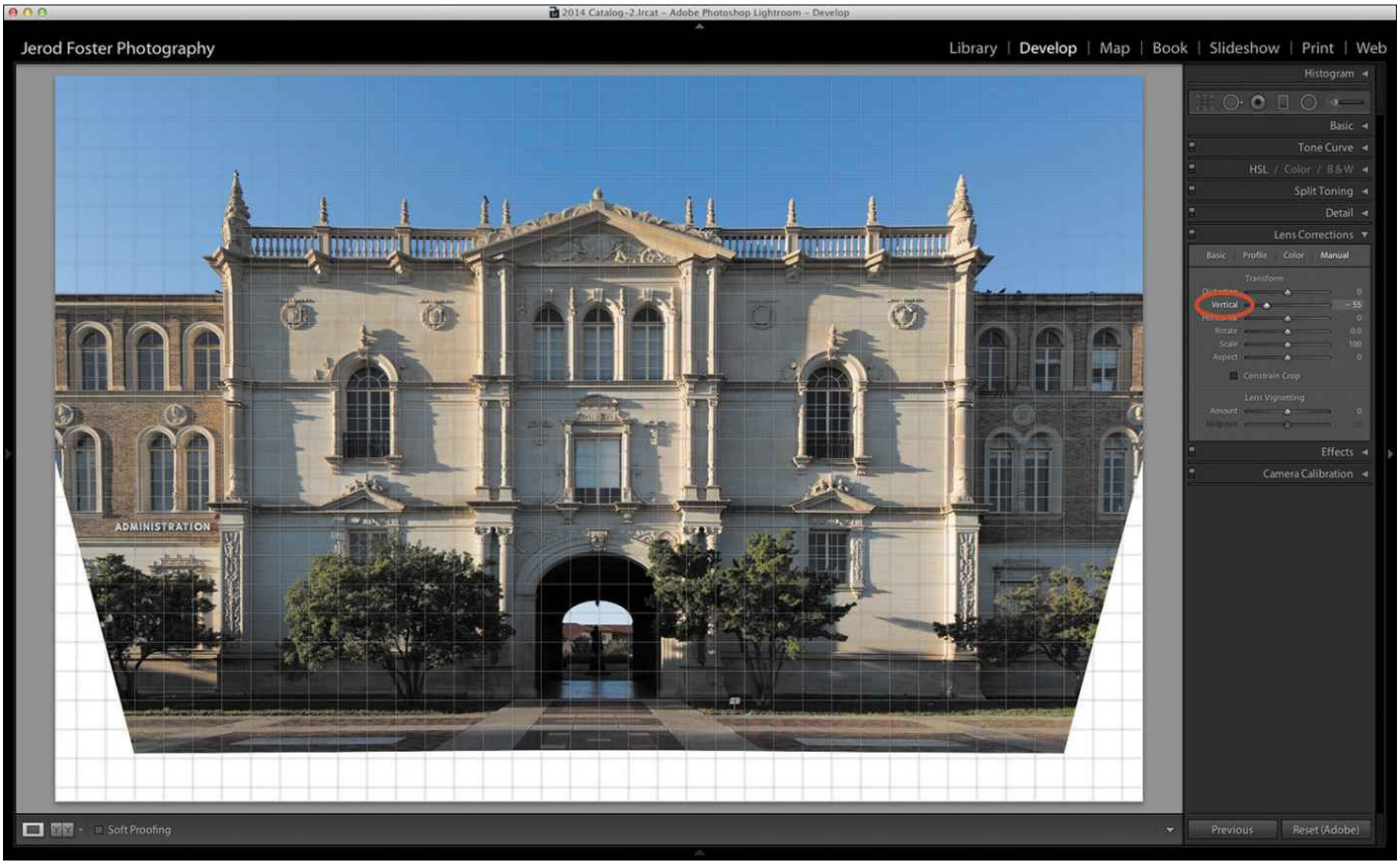


Figure 9.10 **By shifting the Vertical slider in the Manual tab to the left, the keystoning is reduced, but at the cost of some of the image's real estate. You can use the grid lines to ensure vertical lines are straight.**

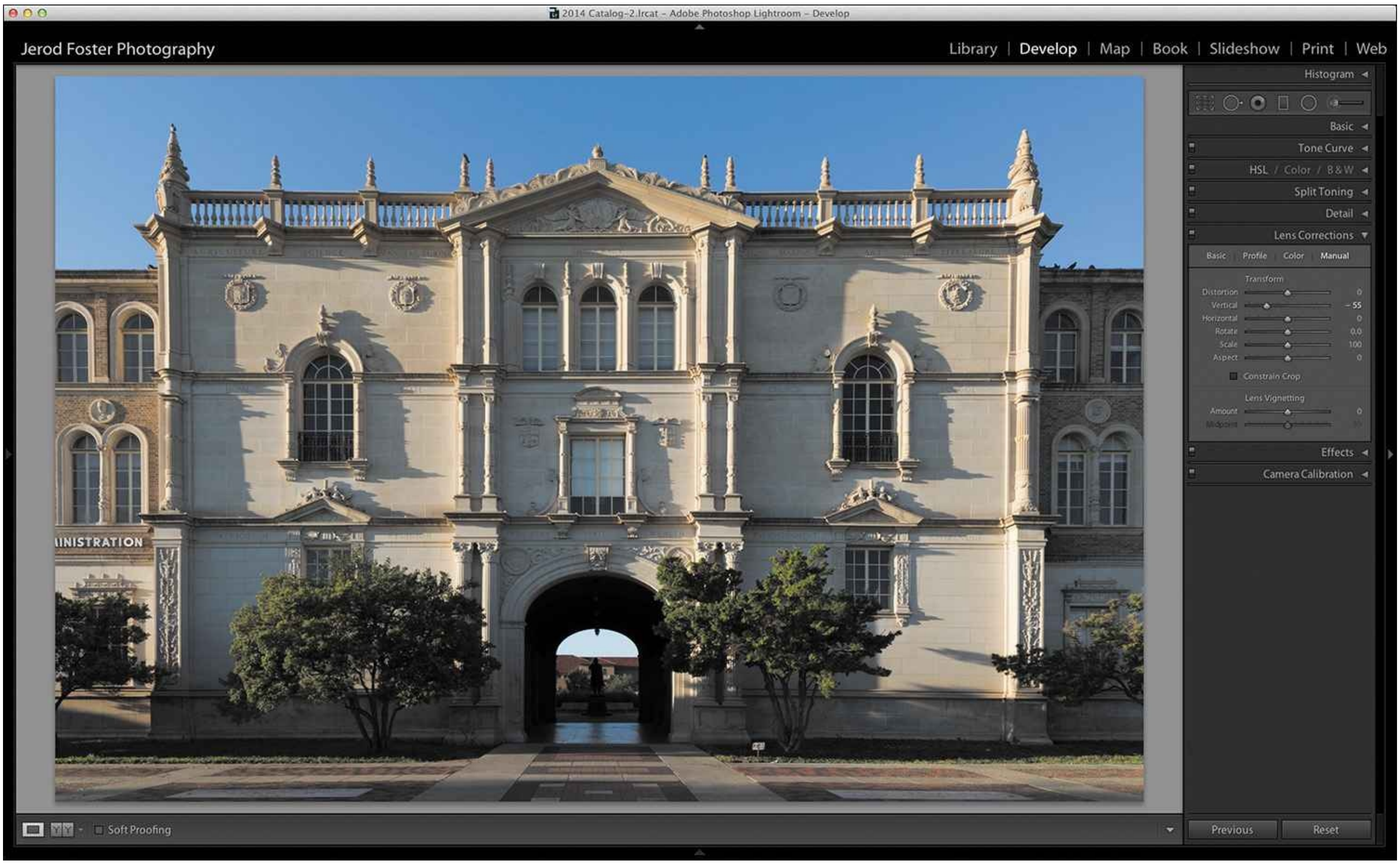


Figure 9.11 A quick crop results in the fixed image. Note that if you use this feature for editorial purposes, it is best to check with your client before pushing the boundaries of the original image.

The best way to approach the Manual tab is to grab each slider and move it to both extremes on the scale to see exactly what each slider does. Note that I don't use the Manual tab much at all, relying more on the Profile tab and ACR's incredible strength in making lens-distortion corrections from its vast bank of lens profiles.

Keep in mind that some distortion cannot be corrected if the effect is too strong. When subject matter is pushed too tightly to the edges of the frame (especially with wide-angle lenses) or lenses are pushed close to the subject, distortion of the subjects and structures in the frame is going to happen, and sometimes it is just too much for correctional technology to mitigate. There's not much to say about this issue other than aim to avoid unwanted distortion before the image is made.

Chromatic Aberration

Chromatic aberration is one issue that does not often translate to a pleasing visual style. This is caused by poor focusing of all color through the lens optics. Chromatic aberration is evident in color fringing that occurs where contrasting colors or light values meet each other in the frame, such as the horizon separating a dark landmass from a bright sky (**Figure 9.12**). Tree branches and leaves against a bright sky also fringe. Typically, the fringe is yellow, red, cyan (a kind of blue), or green. It is not easy to see, but when you zoom into areas, it may be very evident.

ISO 400 • 1/40 sec. • f/8 • 24mm

Figure 9.12 Although chromatic aberration is hard to detect when an image is printed small, this photo contains a fair amount of it where the brighter diffused sky meets the wood fence and background structure.

However, Lightroom makes it fairly easy to mitigate the presence of chromatic aberration. Within the Lens Corrections palette in the Develop module, the Color tab contains all of the tools you need to automatically or manually displace chromatic aberration (**Figure 9.13**). Since the fourth iteration of the software, I have relied solely on clicking the Remove Chromatic Aberration button. I never touch the manual Defringe tools. That said, they can be very helpful in making sure a correction does not shift, say, a yellow fringe to a blue one.

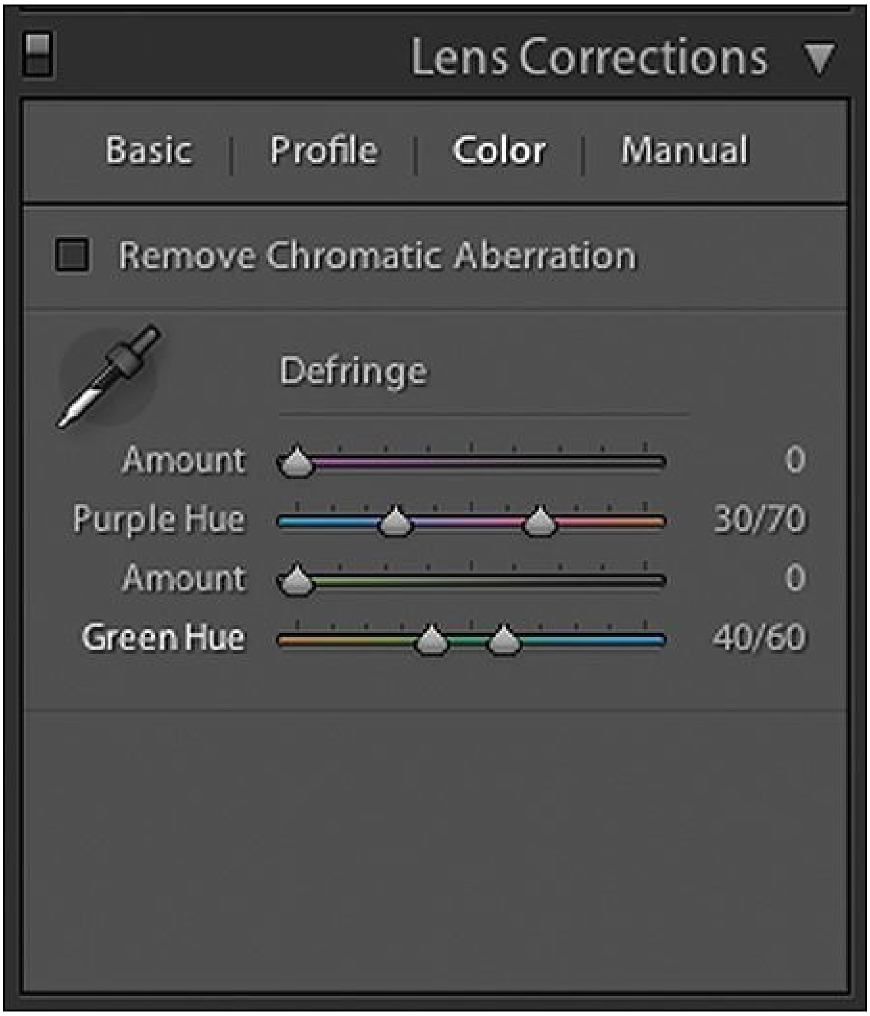


Figure 9.13 The Color tab of the Lens Corrections palette is where all chromatic aberration issues disappear.

To see this correction work, simply magnify an area that visually exhibits chromatic aberration, click the Remove Chromatic Aberration button, and voilà, the fringe disappears (**Figures 9.14** and **9.15**). Check to make sure, though, because the software is not perfect.

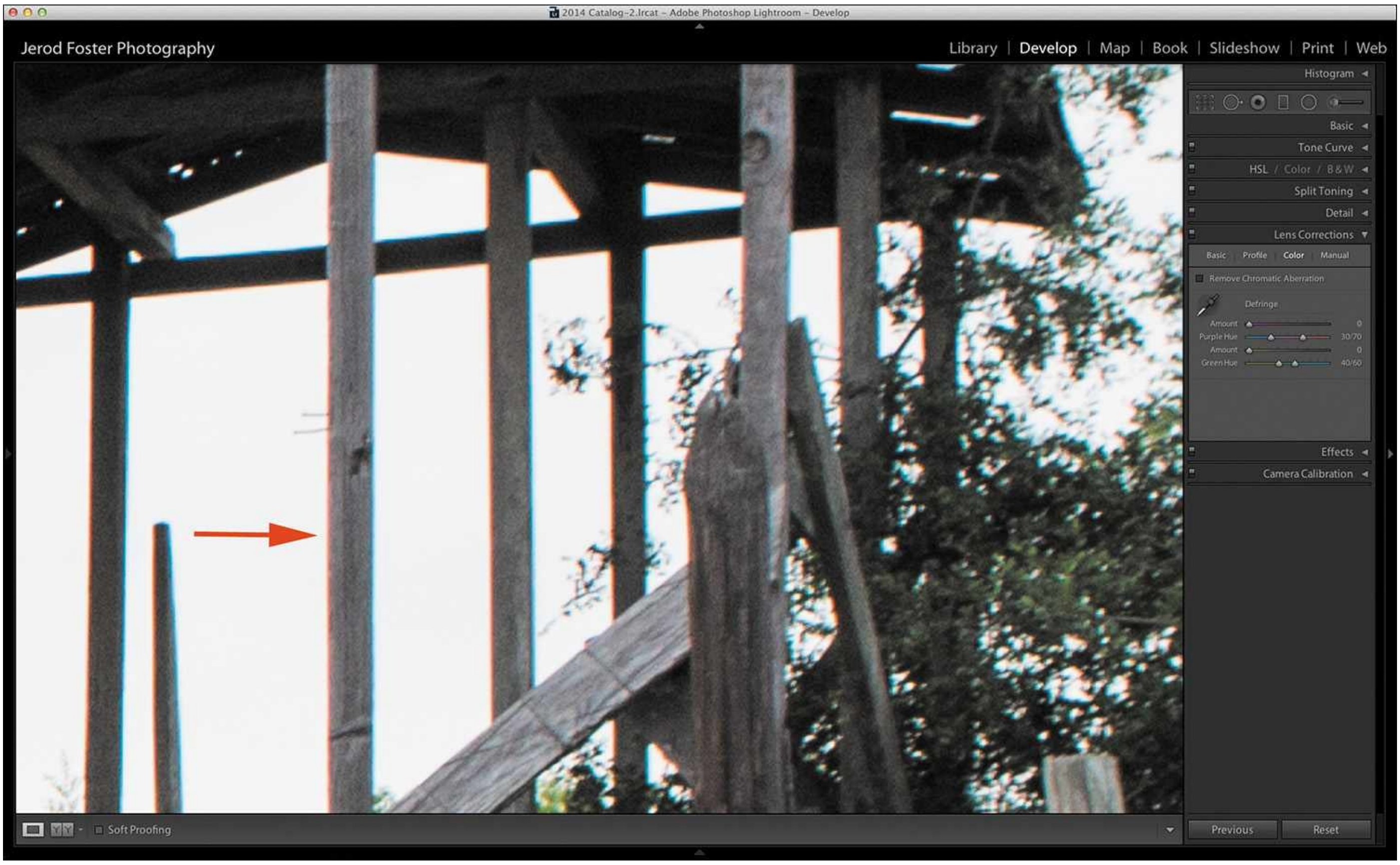


Figure 9.14 **A 2:1 magnification of the image's background structure reveals red and cyan fringing on the wood posts.**

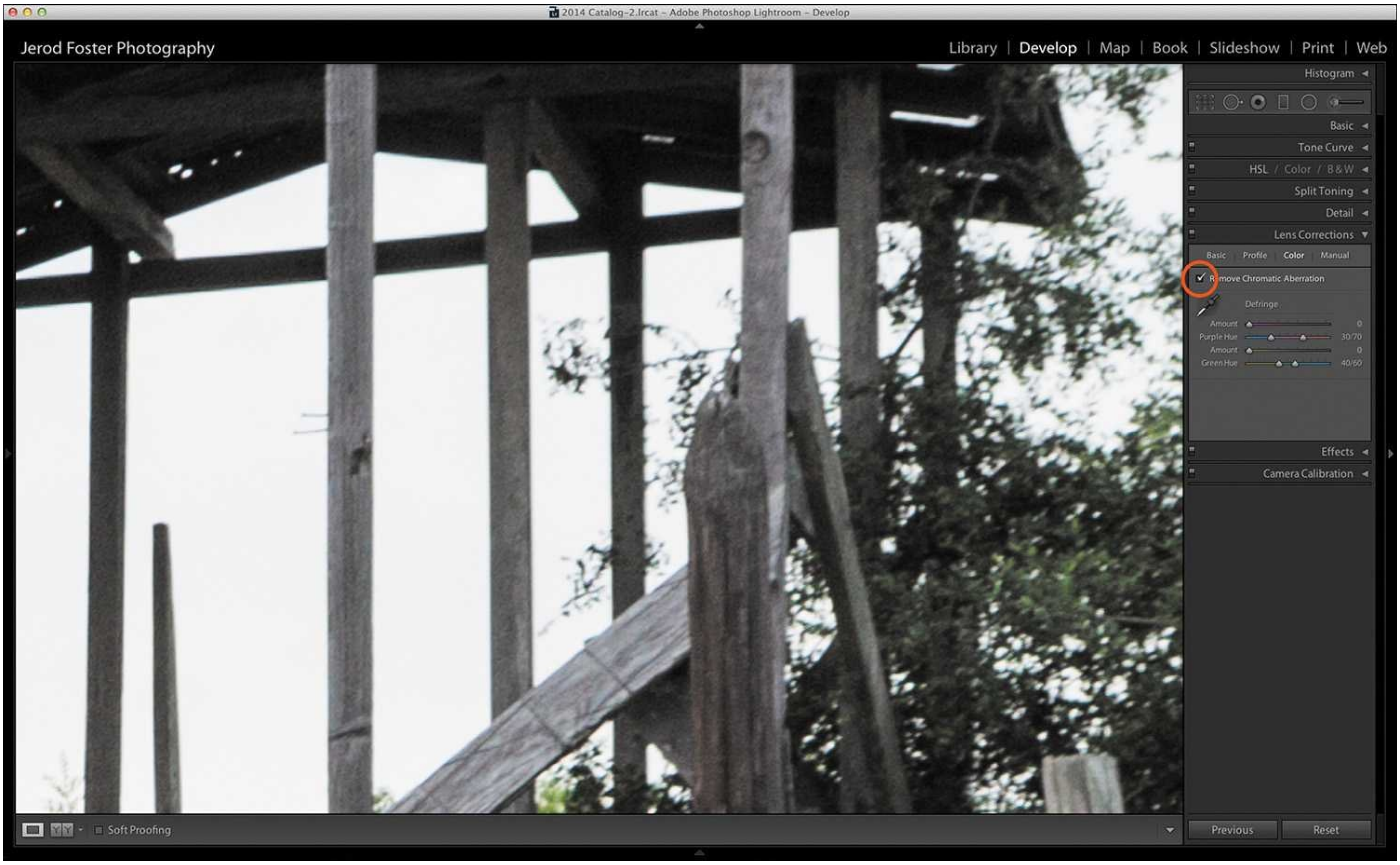


Figure 9.15 **Activating the Remove Chromatic Aberration function quickly removes any sign of fringing. It is best to view this happening while zoomed in at 100% or more.**

Nikon lenses with newer glass technology are less prone to chromatic aberration. I cannot think of one instance where chromatic aberration is desirable for any style, so this issue is something to consider when you're looking to upgrade lenses. Landscape photographers who make large prints are certainly sensitive to color fringing (especially with wide-angles, which seem more susceptible to fringing than telephotos).

The Vignette

Vignetting occurs when the exposure toward the edges of the image's frame begins to drop off, or get darker (**Figure 9.16**). Essentially, light has a much harder time passing through the periphery of inner lens elements in lenses containing several pieces of opticalgrade glass because the outer lens elements are larger and block light from passing through the inner elements. Vignetting is seen in one of three ways, depending on the photographer: 1) it is a pest or cliché and should always be removed; 2) lenses vignette, so don't fix it; or 3) vignettes can be useful to direct the eye.

ISO 200 • 1/1000 sec. • f/5 • 10mm

Figure 9.16 The exposure along the edges of the frame drops off, resulting in vignetting in all four corners, especially at wide focal lengths. Here, it is most noticeable in the lower corners of the dried-up fountain.

Vignetting can happen at any focal length, but it is most commonly found in zoom lenses, especially at the widest focal length. For lenses that vignette quite a bit, the effect is especially visible at more open apertures (**Figure 9.17**) and begins to disappear when the aperture is stopped down (**Figure 9.18**).

ISO 100 • 1/1250 sec. • f/4 • 24mm

Figure 9.17 At f/4, the vignetting at 24mm is considered a flaw by many photographers.

ISO 100 • 1/250 sec. • f/8 • 24mm

Figure 9.18 Stopping down the aperture two stops reduces the presence of vignetting at the edges of the frame.

For many people, vignetting is a desirable stylistic effect. It harkens back to old portraits and historic shots, when lens technology was nowhere near what it is now. Vignetting is also a very useful way to direct the eye in an image. Portrait photographers sometimes like to use vignetting to make sure the subject of the shot is viewed with as little distraction as possible (**Figure 9.19**). Lenses that vignette are useful in this case.

ISO 400 • 1/200 sec. • f/2.8 • 125mm

Figure 9.19 Even though the periphery of the image's frame is dark, a slight vignette was added to the shot to further direct the eye to the lit portion and the primary subject.

Landscape photographers, on the other hand, may find such a lens problematic. The under-exposure on the edges of the frame can dilute the impact of a great vista (**Figure 9.20**). Reactions to vignetting are certainly subjective, and that is why Lightroom (as well as many other postprocessing applications) offer ways to remove vignetting *or* add it to a shot.

ISO 100 • 1/80 sec. • f/4 • 24mm

Figure 9.20 Vignetting can be an image killer for landscape photographers. I'm not thrilled about the heavy vignetting in the corners of this frame—a result of a wide focal length and large aperture.

Like fixing chromatic aberration, removing inherent vignetting can be as simple as one click—the Enable Profile Corrections button in the Lens Corrections palette (Figures 9.21 and 9.22). In the same Profile tab, you can then add or remove some vignetting based on specific lens profiles. The change won't be much, but it might just be enough to achieve the subtle effect needed.

Figure 9.21 Before I clicked on Enable Profile Corrections: Heavy vignetting created technical and interpretive issues that I didn't want in the shot.

Figure 9.22 **After I clicked on Enable Profile Corrections: This feature identified the appropriate lens and corrected for known and programmed issues at that particular focal length, including the vignetting.**

To manipulate the vignetting effect of a lens further, move over to the Manual tab in the Lens Corrections palette. Move the slider labeled Vignette all the way to the right, and then to the left, taking note of how each extreme affects the image. For those images needing a vignette removed, slide the adjustment slowly to the right (**Figures 9.23** and **9.24**). For those needing an eye-directing vignette, slide it to the left. Additionally, you can adjust the size of the vignette by moving the midpoint slider either right or left, making the underexposed area larger or smaller in respect to the middle of the frame. I don’t touch this Manual tab much at all, but it might serve you well stylistically.

Figure 9.23 The Manual tab of the Lens Corrections palette is a great way to control the amount of vignette present in the frame.

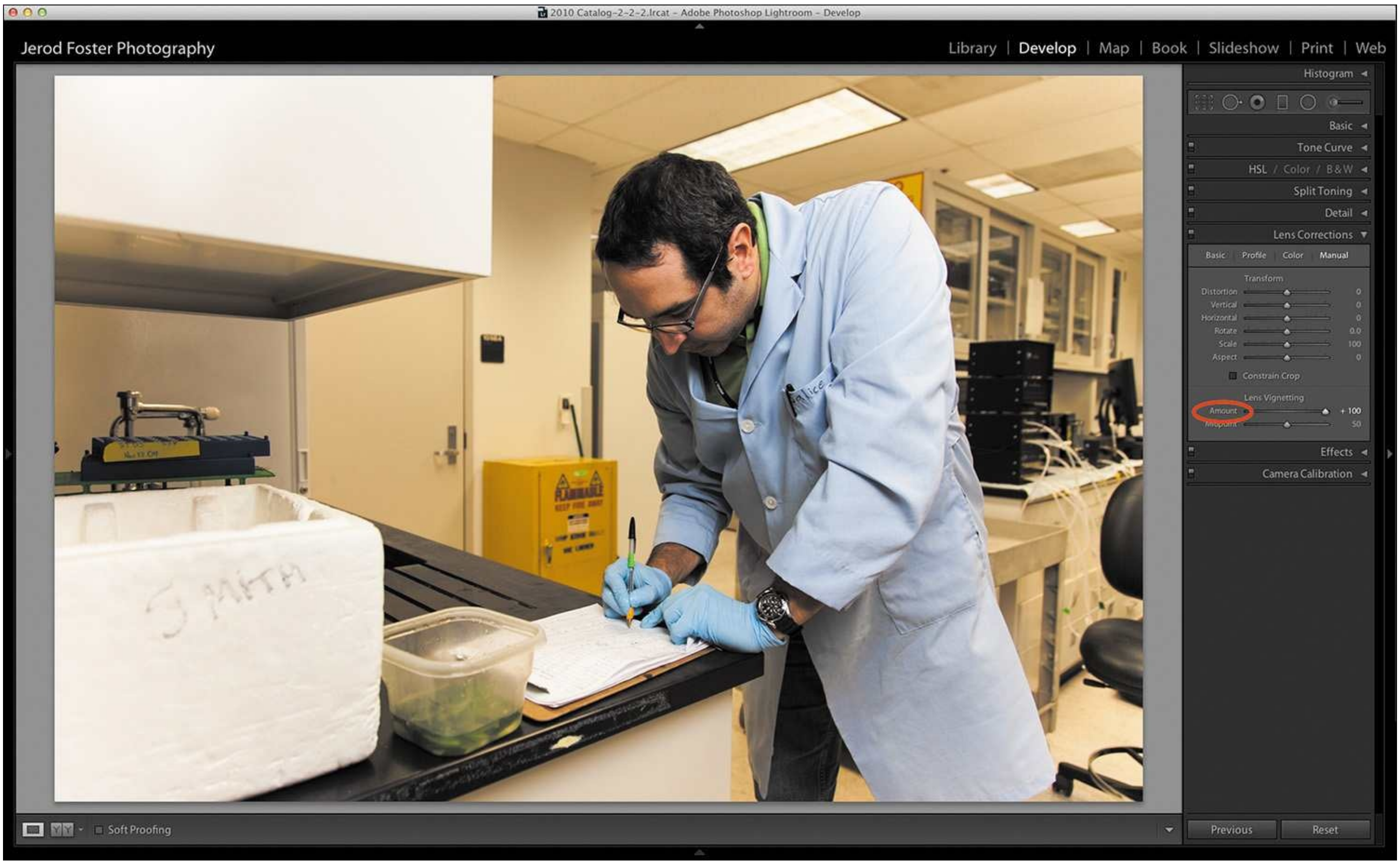


Figure 9.24 Pushing the Lens Vignetting Amount slider all the way to 100 removes the presence of any vignetting around the scientist.

If you are going to add a vignette to an image, I recommend doing so near the end of postprocessing, especially after the image has been cropped. To add a vignette that moves with an image that will be, or has been, cropped, use the Post-Crop Vignetting adjustment under the Effects palette (**Figure 9.25**). Be sure to avoid going too far with it. Move the Amount slider to where you think it should be, then back it off just a bit. More than likely, you will be more pleased with a subtle vignette effect than one that goes overboard or looks cliché (**Figure 9.26**).

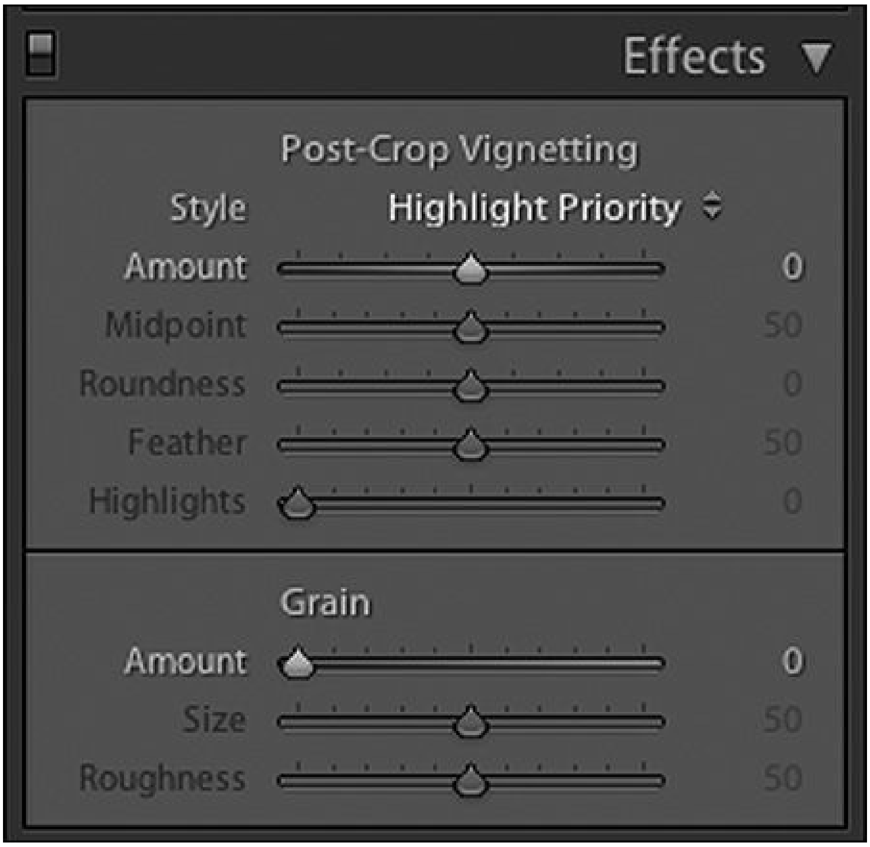


Figure 9.25 The Post-Crop Vignetting tool in the Effects palette of the Develop module offers a great deal of flexibility and control over what happens on the edges of the frame.

Figure 9.26 Try not to go overboard when adding a dark vignette.

The opposite is true when removing a vignette. Moving the slider too far to the right will overexpose the periphery of the frame, which might be worse than having a vignette in the first place (**Figure 9.27**). I typically leave the Style pull-down menu at Highlight Priority (which adjusts exposure of the cropped shot's periphery) and then slide the vignette amount to the desired effect (**Figures 9.28** and **9.29**). Using this particular vignette adjustment also gives you manual control over the midpoint as well as the roundness of the vignette "frame," the softness of the transition between vignetted and nonvignetted space (feather), and how well the highlights in the vignetted area shine through. Each time you crop the image on which the vignette is placed, the vignette will remap itself onto the newly cropped frame.

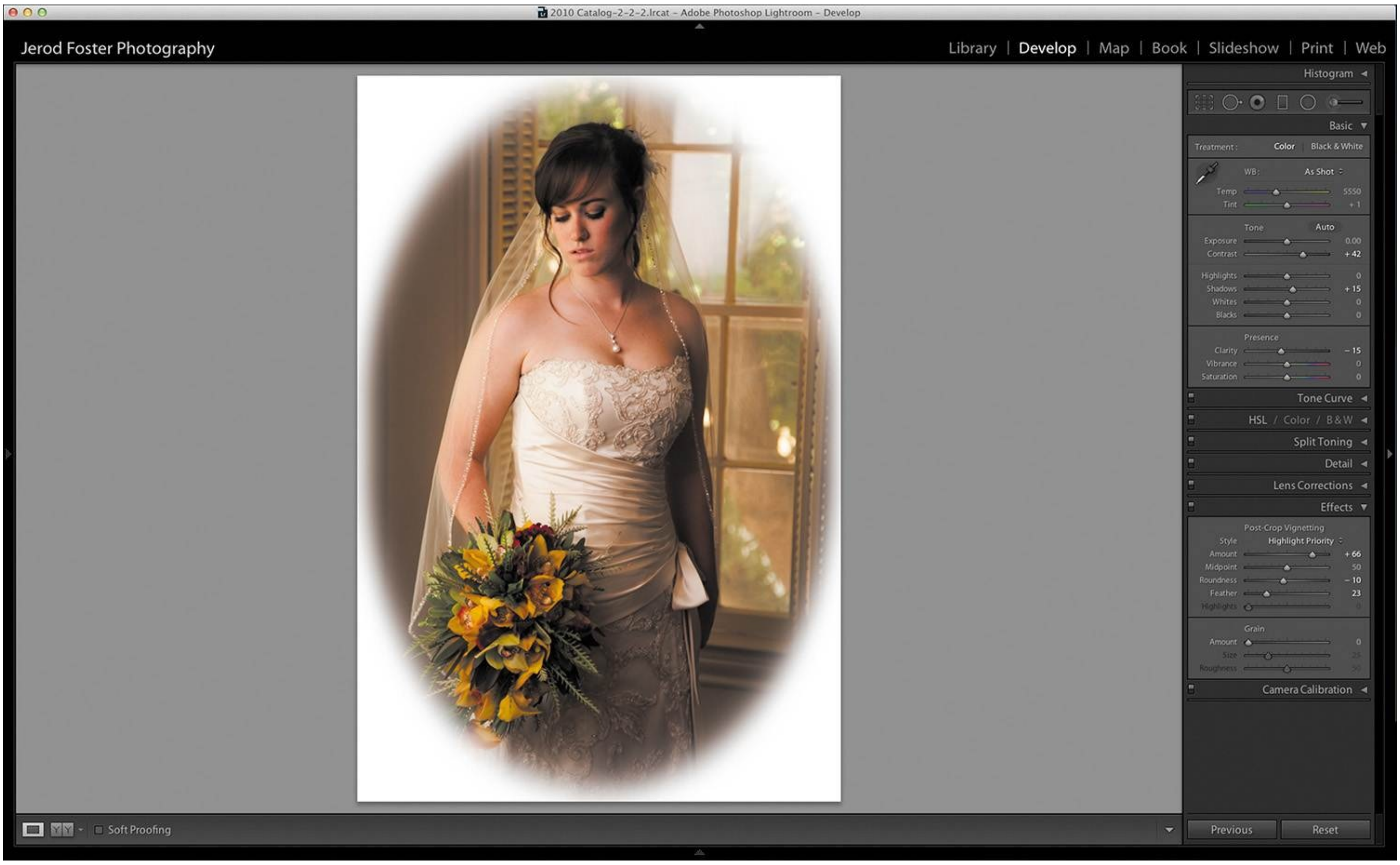


Figure 9.27 **The Post-Crop Vignetting tool can also be used to overexpose an image's vignette—a look that might be even more cliché than darker vignettes (no offense to those who like this look).**

Figure 9.28 **Before Post-Crop Vignetting: A dramatically lit portrait already has darkened corners due to the light's falloff.**

Figure 9.29 After Post-Crop Vignetting: Selecting Highlight Priority and lightly reducing the amount of vignetting adds a bit more darkness to the frame's edges.

Chapter 9 Assignments

Fixing lens issues or adding optic effects in postprocessing may not be the most enticing after-shoot activity, but knowing how lenses work with software is a valuable part of the workflow. Here are a couple of assignments that will help you become more comfortable with this part of the postprocessing stage.

Make use of automatic controls

This is less an assignment and more a suggestion: I encourage you to always turn on Enable Profile Corrections and Remove Chromatic Aberration when postprocessing your images. In fact, I encourage you to make it the first part of your workflow once an image reaches the Develop module in Adobe Lightroom. If you are using different postprocessing software, find out how you can enable corrections of this kind. Removing chromatic aberration, in my eyes, is essential and must be completed (if you like to make big prints, you'll thank yourself later for clicking this button). It's up to you whether you keep the profile corrections enabled, but I advise you to explore the type of distortion correction it makes.

Use vignetting in moderation

Regardless of your attitude toward vignettes, this is a chance to learn how they can be useful and how not to go overboard with them, especially for portraits. Create or select five portraits from various locations. After fixing them up the way you normally would, and after clicking Enable Profile Corrections (remember to do this first), use the Post-Crop Vignetting tools in the Effects palette. Leave the vignetting mode at Highlight Priority and work your way through the sliders, spending most of your time with Amount, Midpoint, and Feather. These sliders will let you explore how nuanced this tool can be. Make your adjustments as far as you would like, and then back off just a bit.

Take a look at your shot afterward, toggling the effect on and off to decide whether or not it was a nice adjustment. This practice will help you to use the effect strategically, such as by adding some vignetting to reduce the distraction of a bright or overexposed background.

Share your results with the book's Flickr group!
Join the group here: www.flickr.com/groups/nikonlenses_fromsnapshotstogreatshots