

Better Landscapes with Flash

By John and Barbara Gerlach

Lighting a portion of many landscape images with flash can greatly improve them. Flash is terrific for:

1. Brightening a dark foreground to make it become more prominent from the rest of the scene.
2. Brightening one or more objects in the foreground, background, or anywhere in the image.
3. Lightening a dark background.
4. Improving the Color of an Important Object in the Scene

Depending on the situation and the intentions of the photographer, the use of flash can be obvious or creatively combined with the ambient light to make it virtually unnoticeable. Modern electronic flash units are quite powerful and rather easy to use with the immediate feedback provided by the digital camera. Anyone can become a flash “guru” by putting into a little effort into understanding your flash and plenty of practice.

You can start your exploration of using flash in your landscape images with any flash you currently own. However, if you are going to purchase a flash, always consider the flash offerings by your camera maker first. If you shoot Canon, consider Canon flashes. Nikon users should look at Nikon flashes and so on. Although third-party flash units may work well, they sometimes don't. Canon shooters can't go wrong with the EX 430, EX 580, or the EX 600 flash units. Nikon users should consider the SB-700, SB-800 (now discontinued but available on the used market) or the top-of-the-line SB-910.

Key Flash Features to Look For

1. Power

The light from the flash must often travel several yards or more to properly light the scene. More powerful flash units emit more light allowing them to work better for lighting distant objects.

2. Wireless Control

On-camera flash is of limited usefulness, especially for landscape photography. Often the foreground must be illuminated below the camera. The on-camera flash can't be tilted down enough to light most foregrounds. Even if it could, the lens or lens hood is in the way.

3. Manual Zoom

Modern flash units are designed to zoom the flash head to allow the light to expose the entire scene that appears in the viewfinder. To do this, the flash zooms to match the focal length of the lens. While this might be useful in a small room when photographing a birthday party, it is largely detrimental in landscape photography where only a small portion of the image needs to be illuminated with flash. Having the capability to manually zoom the lens to a longer focal-length than the lens that is being used is usually necessary to make the flash light the intended object in the scene. Also, the manual zoom feature is a crucial feature for *adjusting the flash output* when using manual flash.

For example, the manual zoom settings on the Canon 600EX-RT flash include 20, 24, 28, 35, 50, 70, 80, 105, 135, and 200 millimeters. It is often necessary to help the flash light up a small portion of the scene. This can be accomplished by zooming the flash to a longer focal length to focus the light emitted by the flash on the object that you wish to light. Rather than using the 20mm zoom setting on the flash to light a log in the foreground, it usually works better if a longer zoom setting such as 200mm is used. Now the light is more fully directed at the object. If you aim the flash carefully, you will get more light on the target. Using a Minolta flash meter V, I ran a test to discover the difference in brightness between the 20mm setting and the 200mm setting is about 2.3 stops of light—a little more than a quadruple in the amount of light!

4. Power Ratios

When a modern flash is used on manual, it typically allows the user to set various power ratios to adjust the flash output. Typical power ratios include 1/1 (full power), 1/2, 1/4, 1/8, 1/16, 1/32, 1/64, and 1/128 power. The flash unit cannot control the size of the burn. However, it can control how long the burn (flash) happens by turning the flash unit off sooner to reduce the light output or leaving the flash on longer to increase the light. *The amount of time the flash emits light is known as the flash duration.* Although the flash duration varies among different flash units, a typical flash duration at full power might be 1/700 second. At 1/16 power the duration will be considerably shorter, perhaps only 1/12000 of a second.

By the way, using short flash durations is precisely how fast action like bullets in flight, a water drop hitting a liquid, or hummingbird wings are captured completely still. We routinely use three or four flash units at once that are set to 1/16 power to freeze the rapidly beating wings of a hummingbird. Although we have to shoot at the flash sync speed for the camera—around 1/200 second for most cameras—if all of the light on the hummingbird is from the flashes and their flash duration is only 1/12000 second, essentially that is just like using a hypothetical shutter speed of 1/12000 second.

Powering the Flash

Some flash units are designed to be plugged into AC power. This is helpful in studio situations or around your home where AC is readily available. However, in landscape photography, AC is seldom available. All the flashes we use are powered with AA batteries. Save yourself a lot of money, wasted time, and lost images. Do not rely on disposable AA batteries. Everyone wants to get their money out of them so they use them to the very end and wait long periods of time for the weak batteries to fill the capacitor in the flash. You are far better off to use excellent rechargeable AA batteries and keep extra fully-charged sets with you at all times. Make it a habit to top them off after every shooting session. Using flash to light portions of your landscape image requires a lot of light from a flash, so you must have ample battery power. Some rechargeable batteries provide more power than others. Superb rechargeable batteries include Eneloops (available at Costcos), Sanyo 2700, and Powerex. Some battery chargers are better than others. I use an An-Mann Digispeed 4 Ultra that charges four batteries at once and a Maha C801D that does eight AA batteries.

Landscape Flash Techniques

Determine the Ambient Light Exposure First

1. The Dark Foreground Situation

Start by forgetting about the flash. Decide what you want the ambient light to do first. If you have a rather light snow-covered mountain in the background and a dark foreground, set the ambient exposure to optimally expose the light mountain background and let the foreground go dark. Now use the flash to light up the dark foreground.

2. The Dark Background Situation

Although not common due to the typical size of a landscape background, there are times when you wish to light the foreground nicely with ambient light and use a flash to light the dark background. Perhaps there is a dark small cave behind a waterfall that would benefit with some light from the flash.

Determine the ambient exposure for the highlights in the waterfall and then use the flash to light the cave.

3. Making the Foreground Stand Out

This may be the most common reason to use flash in the landscape, yet it may be the hardest opportunity to see for the beginning flash user. With a little experience, you'll see opportunities for using flash to highlight the foreground constantly. Here's three recent examples where I used it. While photographing in Michigan's justly famous White Birch Forest on October 19th on a dead calm and overcast day, I set the ambient exposure to be about two-thirds of a stop underexposed and used flash to light up the autumn colors and White Birch trunks in the near foreground. This spotlighted the tree trunks and improved the colors. Overcast has a blue colorcast which is nicely negated by the warm-colored light from the flash on the White Birch tree trunks, making them turn out whiter.

Underexposing the ambient light a little saturates the fall colors in the background. The flash appears like a weak shaft of sunlight hit the birch trees in the foreground. Perhaps that is why Barbara and I often refer to the flash as "the sun in a box." In a second case, I used this technique successfully to highlight the bear claw marks on an aspen tree. I underexposed the ambient light by one stop and in other exposures by two stops and used flash from the side to properly expose the claw marks on the tree trunks. Again, the flash improved the color of the tree trunk and the sidelight from the brighter flash brought out more texture in the claw marks. Using the flash to sidelight the tree trunk is a perfect example for the need of off-camera flash control. In a third situation at Pictured Rocks National Lakeshore, I photographed the tiny waterfalls that is found on the east side of Miner's Beach. It was a cloudy evening with no chance of a red shaft of sunlight penetrating the cloud deck to light the waterfalls. To emphasize and highlight the waterfalls in the low-contrast light, I set the ambient exposure to be about two stops underexposed and then used the flash to properly expose the waterfalls. The brighter warm-colored light from the flash nicely separated the waterfall from the dark gray foreboding background—exactly what I wanted!

Solving the "Kill the Flash" Problem

I started to regularly use flash in my landscape images when I began shooting with digital cameras in 2003. The immediate feedback provided by digital cameras made it far easier to use flash well because I could immediately see what effect it had in the image by viewing it on the LCD display. If the flash wasn't effective, that was readily apparent and steps were taken to solve the problem while the subject was still present. Like all of our photo workshops students, I made the same mistakes in the beginning. All of us "killed" the flash! What does that mean?

Let's photograph Michigan's Moccasin Lake at the peak of autumn color on a calm morning in the golden sunlight. The background of richly colored golden trees with a gorgeous reflection is outstanding. To add depth to the image, a log in the foreground is nicely composed into the scene. This log is still in the shade so it appears as a silhouette in the image. It makes a fine image as a silhouette, but let's now add light to the log to bring out some color and texture in it. Skilled landscape photographers typically stop the lens down to perhaps f/22, use ISO 100 for the best image data, and use a polarizer to reduce glare on the water and shiny leaves and perhaps darken a blue sky. What does this do to the poor flash? Although the flash is quite effective at emitting quite a bit of light for its size, it can't overcome f/22, ISO 100, and another two-stop loss of light from the polarizer. When you point the flash at the log that is 19 feet away and shoot, you are underwhelmed by the results. Either no light appears to have hit the log or very little. You want the log to be brighter. Why is the log not brighter? How can you make the flash light it up more? You must help the flash out. Solving this problem is necessary for nearly all landscape images due to the flash to subject distances involved and the size of the object that needs to be lit up. Over the years, we and some of our brilliant workshop clients who are much more clever than we are have come up with a number of ways to help the flash light things up. Normally, we use a combination of these techniques to stretch the reach of the flash.

Before we solve the "killing the flash" problem, let's look at the numbers that mathematically explain the problem. Let's go back to the old Guide Number system for determining flash exposure that photographers used to use all of the time twenty years ago and we still find the concept useful today.

All flashes are assigned a Guide Number to indicate their relative light output to make them easy to compare with other flash units and to determine the exposure.

$GN = \text{Aperture} \times \text{Flash to Subject Distance}$

The Guide Number of a Canon 580 EX II flash is 190 feet at ISO 100 and the flash zoom set at 105mm according to the specs that come with this unit. Let's work the formula:

$$GN = A \times FD \text{ or } GN/FD = A$$

$$190 \text{ feet}/19 \text{ feet} = f/10$$

However, we were using a polarizer which also cost about two stops of light. Therefore, the aperture needed to be opened up by two more stops of light—from $f/10$ to about $f/6.3$. Since in this example $f/22$ was set, the flash exposure on the log when the flash is fired at full power on manual is $3 \frac{2}{3}$ stops ($f/22$ to $f/6.3$) of light too little and thus remains quite dark. In other words, $f/22$, the polarizer, the 19 foot flash to subject distance, and ISO 100 killed the flash. It simply is powerful enough to overcome all of these limiting factors. We need to help it out and there are many ways to do that. Let's look at them.

Solving the Insufficient Flash Problem

1. Buy a More Powerful Flash

The more expensive flash units tend to be more powerful—that is—they put out more light. But, the difference between a flash and one that is twice as expensive may not be as much as you think. The flash output is generally described with the old Guide Number system. For example, the GN of the Canon 430 EX flash is 43 meters at ISO 100 when the flash shoots at full power and the zoom is at its maximum. The GN of the new Canon 600 EX-RT is 60 meters when zoomed to 200mm and maximum power. What is the difference in light output?

$$GN = \text{flash to subject distance} \times f/\text{stop} \text{ or } GN/\text{flash distance} = f/\text{stop}$$

Let's use a flash to subject distance of 3 meters to keep things simple and then run the formula.

Canon 430 EX Flash

$$GN/\text{flash to subject distance} = 43\text{meters}/3 \text{ meters} = f/\text{stop} = f/14.3$$

Canon 600 EX-RT Flash

$$GN/\text{flash to subject distance} = 60 \text{ meters}/3 \text{ meters} = f/20$$

Let's round-off the $f/14.3$ stop to $f/14$. What is the difference? Here is a portion of the standard f/stop series in $1/3$ -step increments.

$f/11$ $f/13$ $f/14$ $f/16$ $f/18$ $f/20$ $f/22$

The difference between f/14 and f/20 is one stop of light. The Canon 600 EX-RT flash is only one stop more powerful than the Canon 430 EX flash that is one-third the cost. Nevertheless, it is helpful in landscape photography to use a flash that can output one more stop of light—in other words—it can throw twice as much light on the subject. The less powerful flash units are fine for close-up and general purpose photography, but the more powerful ones are best for landscape photography.

2. Increase the Flash Compensation

Your camera system offers a way to compensate the ambient light exposure and a second way to compensate flash exposure. The flash exposure compensation control (FEC) might be found on the flash, the camera, or both. Increasing the FEC from zero to plus two should force the flash to put two more stops of light on the subject. This assumes—of course—that the flash isn't already putting out everything it has and other factors such as subject reflectance aren't causing the flash to turn off prematurely. Generally, though, setting the flash compensation to higher plus values will throw more light on the subject. However, in landscape photography, it is generally better to use manual flash, so the flash compensation control becomes deactivated.

3. Don't Use the Polarizing Filter

Polarizing filters are often necessary for the finest landscape images because they can darken a blue sky—especially when shooting at an angle to the sun—and they are especially effective at minimizing reflections. In many cases, especially when photographing water, it is best to accept that the polarizer will absorb about one to two stops of light and thereby weaken the ability of the flash to light an object. However, in cases where the reflections aren't too problematic, then take the polarizer off to double or quadruple the flash unit's ability to light objects up at some distance.

4. Take the Diffuser Off!

Many flash units come with a device to soften the light output from the flash to reduce the harshness of the shadows. Beginning flash users often believe the diffuser should always be used. This is hardly the case, especially when the flash is being used as only a portion of the overall exposure because it is being mixed with ambient light. Diffusing the flash is far more important when the flash is being used as the sole light source or being used with other flashes at the same time. It is seldom necessary to diffuse the flash when ambient light is being allowed to light the image, too.

5. Push up the ISO

Increasing the ISO—say from ISO 100 to ISO 400—effectively quadruples the ability of the flash to light an object. The flash doesn't actually emit any additional light, but the light that is emitted is amplified by the camera to effectively brighten the object another two stops of light. We nearly always increase the ISO anytime we are using flash to light the landscape. The quality of ISO 400 is excellent and it is like buying a flash that is two stops more powerful.

6. Open up the Aperture

The aperture controls the depth of field in the image. Landscape photographers tend to want plenty of depth of field so using f/stops in the range of f/16 to f/22 is commonly done. However, if you can get by with less depth of field, shooting with f/16 rather than f/22 effectively doubles the light from the flash. Opening up to f/11 quadruples the light reaching the sensor, assuming the use of manual flash—of course. We often don't stop down quite as much as we normally would to help our flash light distant objects in the scene. It is even possible to use the focus stacking technique to regain adequate depth-of-field.

7. Move the Flash Closer to the Subject

The Inverse Square Law describes how light attenuates over distance. If you double the distance between the flash and the object to be illuminated by it, the light is **not** one stop weaker, but is two stops weaker because the flash has spread out over an area that is four times as large. Therefore, an excellent way to put more light from the flash on the target is to move the flash closer to it. The flash output is not dependent on the camera to subject distance, but, rather the flash to subject distance. It is very effective to have a friend hold a wireless flash closer to the subject or mount it on a light stand near the subject. Photographers who use wireless devices to fire the camera can easily hold the flash close to the subject themselves. I enjoy my Canon 600 EX-RT flash because when set to wireless radio slave and used with the ST-E3-RT flash controller, I can press the release (REL) button on the flash to fire my camera while quite some distance away from it. Being able to trip the shutter from a distance allow the photographer to hold the flash where it is needed!

8. Zoom the Flash

The typical fully-featured flash has an auto zoom control that allows you to adjust the flash head to emit light at an angle that corresponds to the angle of view of the lens. A 24mm lens, for example, has a wide angle of view so the flash adjusts its light output accordingly to match the angle of view. A 100mm lens has a much smaller angle of view so the flash changes its coverage to restrict how widely the light is

spread. It seems obvious that you want the angle of view of the flash to match the angle of view of the lens. Using a flash zoom setting of 105mm will create dark corners if you photographed a birthday party with a 50mm lens. If you were shooting with a 100mm lens, then having the flash zoom control set to 24mm would be wasting much of its light output.

However, using flash to light only a portion of the landscape scene means you virtually never want the flash's zoom to match the focal-length of the lens. In almost all cases, it works best if a longer zoom setting on the flash is used. This means the flash must be set to manual zoom. Now you can shoot whatever zoom setting is available, no matter what focal-length of lens is being used. The typical flash offers several zoom choices. The Canon 580EX II flash, for instance, offers 24, 28, 35, 50, 70, 80, and 105mm. If you pull out the built-in wide-angle diffusion panel, you can have 14mm, too. The new Canon 600EX-RT offers 20, 24, 28, 35, 50, 70, 80, 105, 135, and 200mm. Being able to zoom the flash to 200mm offers an enormous advantage to the landscape photographer because it concentrates the light output from the flash which allows it to light an object at much greater distances. Using a flash meter, I learned that the light from the flash is about 2 1/3 stops brighter when the zoom is set to 200mm than 24mm. It isn't that the flash is putting out more light, rather, the light is more tightly focused to prevent it from spreading out (Inverse Square Law again) too quickly. The zoom will be one of your most used controls on your flash for lighting more distant objects and for adjusting the exposure when using the flash on manual.

9. Use More than One Flash at the Same Time

An easy way to double the amount of flash light on the subject is to shoot two identical flashes at once. If everything is set the same, firing two Nikon SB-910s or two Canon EX 430 flashes will double the amount of light. Of course you need to have two flashes which are expensive. Not everyone can afford to own or wish to carry the extra weight of a second flash. But, it is a solution that we use frequently. The best way to fire two flashes simultaneously is to use wireless controls. If both flashes are set to receive the signal from the wireless master, both remote (slaved) flashes will fire. Due to our hummingbird workshops, we own about forty flashes and these include several Nikon 800s and Canon 580s. We sometimes do fire two flashes at the same time to double the light output. If that doesn't do it, then we could shoot even more flashes. To double the light output again, how many identical flashes are needed? The correct answer isn't three—it is four. After that, one would need eight flashes to double the light output and then 16 flashes to double that again. I think most people will stop at two flashes, but using four at once is quite feasible if you own them.

10. Fire the Flash Multiple Times During a Single Exposure

When a manual flash is fired at full power, the entire energy load that is stored in its capacitor is used to make the light. The flash then must draw energy from the batteries and refill the capacitor. This happens quite quickly with a well-charged set of batteries, but it isn't instant. I just tested my Canon 600EX-RT flash and it took about 5 seconds for the capacitor to refill with energy as indicated by the ready light on the flash which turns red when the flash is ready to fire. Obviously, it isn't possible to fire the same flash at full power more than once for any exposure that is shorter than 5 seconds. So how is this useful? The quality of higher ISO choices on your digital cameras continue to improve. You may have noticed that you are seeing in books and magazines more night shots of the star-filled sky. We are doing them too. You can't meter for the stars because they are small specs of light in an otherwise dark background. Instead, you must run tests for the stars. We have already done that and here are our starting guidelines. Set your camera to manual exposure, ISO 3200, f/4 or f/2.8 if you have a lens that fast—the f/2.8 lens will pick up more stars, and use a 20-second exposure time. With this long exposure time, it is easy to manually fire the flash multiple times! Suppose five attractive pine trees are nicely arranged on a hillside with a star-studded sky behind them on a cold winter night. It is possible to focus on the trees with a short lens and be near infinity so everything is sharp—including the stars. Set the camera to ISO 3200, 20 seconds, and f/2.8. Trip the shutter and immediately manually fire the flash at one tree and do a second tree five seconds later and the third tree at 10 seconds and the fourth at 15 seconds and finally the last tree at 20 seconds. Now each tree is illuminated with light from the flash which is fired a total of 5 times during the 20-second exposure. Naturally you would test the flash exposure ahead of time before actually shooting the 20-second exposure to capture the stars. If full power on the flash is too bright, the good news is you get to use perhaps $\frac{1}{2}$ or $\frac{1}{4}$ power which means the recycle time of the flash is quicker than 5 seconds.

You might wonder how a flash can light up a tree twenty yards away. When you are using f/2.8 or f/4 and ISO 3200, the light from the flash can effectively light things up a long ways away. Warning! When manually firing the flash with the Ready button, make sure you know that flash is firing its full charge. The Ready button is designed to tell you when the flash is ready to fire and pressing it lets you test the flash. However, in the default setting on most flashes we see, pressing the Ready Light button to test the flash does not fire it at full power. When using autoflash, for example, my Canon 600 flash is set to 1/32 power when the test button is pushed. I set the custom function—C.Fn-07—to full power. Of course, normally I am shooting the flash on manual when doing landscape images, so it does fire at full

power without setting the custom function in this mode. Be sure to check your flash to see what it does when you manually fire the flash.

11. Eliminate the Pre-flash by Using the Flash on Manual

The typical automatic flash uses through the lens metering by sending out a small pre-flash immediately before the main flash. This pre-flash takes into account many variables to help it arrive at a more accurate exposure for the main subject. Both the pre-flash and the main flash that immediately follows it must come from a single charge of the capacitor as there is no time for the capacitor to fully charge itself between the two successive bursts of light. By the way, the pre-flash and the main flash are fired so close together that we perceive it as a single flash. Obviously, this pre-flash uses some of the energy that could have been used to make the main flash a little bit brighter. To get the maximum amount of light from the flash, use it in the manual mode to eliminate the pre-flash. In landscape photography, we nearly always use manual only for the flash. This means you can't use the flash exposure compensation control (FEC) to adjust the flash output. Due to the larger distances involved, it is no problem. We adjust the flash output primarily by adjusting the power ratio control, zooming the flash wider for less light or tighter for more light, adjusting the flash to subject distance, or, more often, a combination of these three choices.

12. Use a Flash Extender

There are devices that fit over your flash head that support a Fresnel lens which concentrates the light from the flash and makes it reach further because it is more tightly focused. Many wildlife photographers use these devices to extend the reach of the flash. This also works quite well in landscape photography.

13. Aim the Flash Carefully

Although it should be obvious, it is important to actually point the flash directly at the target to get the maximum effectiveness from it. If you have poor aim, it is possible to miss the object to be illuminated entirely or only light a portion of it. It surprised us, but we find at least half of our workshop clients have a tendency to aim the flash poorly! You must point the flash correctly and precisely at the target to get as much light as possible on it.

14. Focus Stacking

Shooting at the fastest aperture on the lens allows more light from the flash to strike the sensor, but the depth of field is often inadequate for landscape images when using f/2.8 to f/8. Focus stacking is a method where a series of images is shot using minimal depth of field. The focus is changed slightly between images so everything in the landscape where sharp focus is desired is sharply focused in at least one of the images. Helicon Focus, Zerene Stacker, or Photoshop are software programs that are used to combine the stack of images into a single image where everything is sharply focused that is desired. By keeping the flash at the same angle and same power output, the flash exposure remains the same from image to image.

15. Multiple Exposure

While teaching a summer workshop in Michigan, I asked the group if they could think of another way to help the flash out to light objects in the landscape. Our good friend, Al Hart, who helps me edit our books quickly stepped up and suggested multiple exposure—one that I had not considered before. Only my last Canon camera, the 5D Mark III, has even let me shoot multiple exposures to produce a single image. As soon as Al shouted out “multiple exposure”, the rusty gears in my overworked brain began to creak and grind and smoke while I slowly processed what he said. Later that summer, I began to shoot multiple exposures in conjunction with flash and a whirlwind of new ideas emerged.

I first tried it out by photographing my favorite test waterfalls on the east end of Miner’s Beach in Pictured Rocks National Lakeshore. On a dark cloudy evening, Barbara and I visited the waterfall to shoot moody images of it. We did the cloudy versions and then underexposed the ambient by two stops or so to darken the sky behind it, but not make it black. The flash was fired during the ambient light exposure. I used the flash set to 24mm because the tiny two-foot high waterfall was only about 6 feet in front of me. The 24mm zoom setting prevented overexposure (remember I am using the zoom control to adjust the exposure with the flash set to manual) of the close waterfalls and spread out the light in the foreground more evenly. For the second of the two images, I zoomed the flash to 200mm and pointed it at the rock face several yards behind the waterfalls and lit it beautifully. I had to zoom the flash to make the flash reach further. The results were wonderful!

During the next day, we photographed Scott’s fall which has a rather small dark cave behind it. I set my Canon 5D Mark III for Multiple exposure and chose the Additive option—there is also Average, Bright, and Dark choices, but I haven’t done anything with them yet). Here’s how I shot the waterfalls and lit up the dark cave behind it.

1. Determine the ambient light exposure in the usual way by selecting f/16 for depth of field and manually adjusting the shutter speed, until the histograms rightmost data is touching, but not climbing the right wall of the histogram. Because this is a double exposure, to avoid overexposing the ambient light portion of the exposure, I then increased the shutter speed by one stop. (Note: When using the Additive Multiple Exposure Mode with Canon, their guideline according to the manual is to underexpose both exposures by 1 stop when shooting two images. With three images, underexpose by 1.5 stops and four exposures should be underexposed by 2 stops.)
2. After focusing and composing, I walked over to the side of the waterfalls to get an unobstructed view of the cave behind it. I did not want to shoot through the waterfalls (this time) because I didn't want to freeze any of the falling water with the flash and the flash to subject distance is less making the flash more effective at lighting the dark cave. Using the Release button on my Canon 600 EX-RT flash, I triggered the camera twice.
3. Naturally, the flash was pointed at the back of the cave. The cave got a double dose of light from the flash. Essentially, lighting the cave twice with the flash is adding one more stop of light from the flash. Everything worked out beautifully. Remember I do not need to underexpose the flash portion of the exposure because I am trying to get more light from the flash—only the ambient light portion of the image needs to be underexposed.

Controlling the Flash Exposure

Usually it isn't the case, but should I find that I need to reduce the output from the flash, I primarily do it with three different ways that can be used singly or in combination. They are:

1. Adjust the Power Ratio
 - a. Typical power ratios are 1x, $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{16}$, $\frac{1}{32}$, $\frac{1}{64}$, and $\frac{1}{128}$. Each varies by 1 stop of light. Therefore, to reduce the output from the flash by 2 stops, if I am set at full power (1x), I must change the power ratio to $\frac{1}{4}$ x.
2. Zoom the Flash Head
 - a. Changing the zoom on the flash does affect the flash exposure. With my Canon 600 EX-RT flash, changing from 24mm to 200mm (the maximum zoom available) will increase the light on the subject by about $2 \frac{1}{3}$ stops of light. To reduce the amount of light on the target, change to a shorter zoom setting. Changing the zoom isn't precise like power ratios are, but it does work quite easily. I just guess at the zoom setting I want,

take a picture, and then look at the results. If too bright, I switch to a shorter zoom setting. If not bright enough, I choose a longer zoom setting.

3. Change the Flash to Subject Distance

Always remember when using off-camera flash (usually wireless, though, it is possible to wire it to the camera), the flash exposure is tremendously influenced by the flash to subject distance and has nothing to do with the camera to subject distance—when used on manual. If you are using automatic flash exposure, the flash will compensate its light output as the flash to subject distance changes.

Let's return to using the flash manually. If your camera is 20 feet away from the subject, but you hold the flash 10 feet away, the flash is twice as close. That means the flash is putting—not one—but two stops or four times more light on the target. As you can see, changing the flash to subject distance can greatly affect your lighting capabilities. Putting the flash closer has other benefits. If you don't need to shoot the flash at full power, then you have a faster recycle time and the batteries remain charged longer.

Summary

I find the most common problem when using flash in landscape images is getting the flash to light up whatever I want it to. Usually, I start out right away by increasing the ISO to 400—from 100—maybe only stopping down to f/11, consider removing the polarizing filter, and zooming the flash head to a longer focal length. If that doesn't work, I move the flash closer to the object where light is desired. Usually this combination does the trick, and, if not, there are plenty of other things that can be done that were mentioned earlier.

Good-luck!