Massachusetts Wildlife

No. 3, 2024

$3.00

Yellow Garden Spider,
Fisher, Meet the Mustelids,
Photography Fundamentals

Reserve this New License Plate now *with the Mass. State Chapter of NWTF*

Since November 2023, the Massachusetts State Chapter of the National Wild Turkey Federation (NWTF) has been promoting and taking reservations for a new license plate being introduced in the Bay State. Proceeds from the sale of the plate will support the NWTF Massachusetts Chapter, a non-profit 501(c)(3) organization established in 1983, in its work to improve habitat and protect more open space with MassWildlife and other like-minded organizations and to ensure the continued conservation of the Eastern wild turkey, arguably one of the state's greatest restoration and conservation success stories. Beginning in 2019, the NWTF Massachusetts Chapter has been working with the Registry of Motor Vehicles (RMV) to develop a Massachusetts Wild Turkey license plate. The design has now been approved and the plate is available for pre-order to hunters, conservationists, and others who love having wild turkeys throughout our state. The new plate's design features a full-color Eastern wild turkey and was created by the graphic design team of the NWTF. To get this specialty plate into production, the NWTF Massachusetts Chapter must receive reservations for 750 plates and provide the names and addresses of the people who intend to purchase them to the RMV. Production will not begin until 750 plates have been reserved, processed, and paid for, so please share this opportunity with your family, friends, and colleagues. Individuals who reserve the first 750 plates will also receive a free, one-year membership to the NWTF. The initial cost of the license plate will be $40, with $28, which may be tax-deductible, going directly to the NWTF Massachusetts Chapter to support its habitat conservation and restoration work for the wild turkey in the Commonwealth. A $20 swap fee will also be collected by the RMV when the new plates are ready.

To learn more about this specialty license plate, the work of the NWTF, and how you can participate in its efforts, contact Joe Judd at **jjontheridge@comcast.net** or Keith Fritze at **centralmassnwtf@gmail.com**. They can discuss past and current land and habitat conservation projects with you, help you reserve this beautiful and impactful specialty number plate, and explain the potential tax deduction.

MASSWILDLIFE

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Photo © Troy Gipps

Photo © Josh Gahagan

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Photo by Troy Gipps/MassWildlife

MASSACHUSETTS WILDLIFE

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Features

On the Cover: A mature female yellow garden spider (*Argiope aurantia*) hangs in the center of her web shortly after dark. This common species is one of the largest orb weavers in Massachusetts, with a body length of one inch and over two inches in total with its legs included. Photo © Troy Gipps, Canon EOS 5DSR, Tamron SP 90mm Di Macro VC USD, Canon Speedlight 430EX III-RT, f/11, 1/200 second, ISO 1250.

Photography Fundamentals

by Troy Gipps

Photo by Troy Gipps/MassWildlife

No photography skill is required to recognize a beautiful photograph of nature or wildlife, and this article will likely not enhance your ability to appreciate such images because their story is told without the need for language. A successful photograph results when a photographer presents what they want you to see and nothing more. We can see that result with clarity. Equally, we can see the absence of clarity. Poor lighting, a blurry subject, and distracting elements that pull the eye from its intended place all detract from a photograph's message. These tend to be the first elements we notice in a "bad" photograph. The essential element, however, which is difficult to describe with words, but lies at the core of what it means to have an "eye" for photography, is composition.

A good starting point for discussing composition is to think back to the last time you were on vacation with your significant other, friends, or family and you asked a stranger to take your photo—usually against a backdrop of some beautiful "vacationy" vista. You passed your camera or smartphone to the willing stranger and gathered to smile for a photo that would capture all the joy and excitement of going on vacation to... "Sky." That's right, Sky, because 9 times out of 10 the person who took your picture will have placed your heads in the exact center or lower center of the frame, cutting you all in half and filling the top half to two-thirds of the frame with sky. Hence, a photo of your long-awaited, epic vacation to the sky. You will also be too small in the frame because the accidental photographer, who didn't want to invade your personal space, will have backed up after taking your camera and may have even leaned back further right before snapping the photo. These types of images perfectly illustrate poor composition because these people holding cameras (not photographers) have hyper-focused on your request, which was to take a photo of you and your family or friends, and that's all they see when they look through your camera's viewfinder or at your smartphone screen—you and your group. From their perspective, you might as well be floating in space, which is why where you are situated in relation to everything else around you is not considered in the millisecond before they depress the shutter button or tap the screen to capture your image. To be a successful photographer who routinely shoots images that are pleasing to the eye, you must avoid this tunnel vision. In truth, what you actually asked the stranger to do was to take a photo of you and the place you were visiting and to balance all the elements in the frame, from foreground to background, in a visually pleasing manner while maintaining crisp focus on the subject and maximizing the effects of light and color. That is, of course, a lot to ask of a non-camera-toting passerby, especially when you simply say, "Excuse me, can you take our picture?" But these are necessary skills for anyone seeking to claim the moniker "photographer."

Just as writers hear and ponder many words in their heads before putting pen to paper or striking a key, photographers must see and evaluate all the visual elements that appear in the world around them, identify their subjects, and then manipulate their camera's controls to capture the desired image.

Regardless of what type of camera you have, from an advanced DSLR or a mirrorless camera body with interchangeable lenses to a smartphone, all cameras are simply boxes that contain a lens through which light passes so it can reach a light-sensitive material on the inside, such as a digital sensor or film (or, way back in 1839 when photography was born, a copper plate coated with a thin layer of highly polished silver—a "daguerreotype" process invented by the painter Louis Jacques Mandé Daguerre). The amount of light passing through the lens is controlled by the lens **aperture** and camera's **shutter speed**. The third factor controlling the exposure level of light is the **ISO** setting (or, in the heyday of film, "film speed"). ISO stands for the International Standardization Organization

Photo by Troy Gipps/MassWildlife

While today's digital cameras are nothing short of technological marvels, they are actually not unlike the earliest cameras, such as this Brownie No. 2 A, Model B, circa 1907. All cameras, even smartphone cameras, are simply boxes that contain a lens through which light passes so it can reach a light-sensitive material on the inside.

and refers to the sensitivity of a sensor or film to light. Photographers control these three numeric values to manage light and create their images.

The aperture of a lens works much like the pupil in your eye. When you go outside into the bright sunlight the size of your pupil shrinks to limit the amount of light that passes through your lens and reaches your retina. Conversely, at night, your pupils enlarge to allow more light in so you can see better in the dark. Interchangeable camera lenses have an adjustable aperture controlled by 7–10 thin metal blades that rotate in unison. Each incremental aperture setting is assigned a number; lower numbers are more open and let in more light. The typical range of lens aperture numbers are: 1.4, 2.8, 4, 5.6, 8, 11, 16, and 22. They are referred to a "f-stops" (e.g., f/4, f/8, f/22).

Think of shutter speed as the blinking of your eye and imagine snapping a picture with your eye as you blink, and then think of what the effect would be if you varied the speed at which you blinked. For this exercise, start with your eyes closed and then blink in reverse by opening and closing your eyes at a typical blink speed (very fast). You'll see a quick flash of what's in front of you and there will be no time for anything to move through that snapshot in time, so the image would stop all action. Now close your eyes again and blink in reverse very slowly. If what you are looking at is moving or if you are moving, the image painted with light on your retina will be blurred. That's the essence of shutter speed. The typical range of shutter speeds are 1 second, 1/2 second, 1/4, 1/8, 1/15, 1/30, 1/60, 1/125, 1/250, 1/500, 1/1,000, 1/2,000, 1/4,000, and 1/8,000 of a second.

ISOs in digital cameras range widely depending on the sensor's level of light sensitivity. Basically, some sensors perform better in low light, so their effective ISO settings are much higher. These sensors usually have fewer megapixels (such as 20 MP or 24 MP). Cameras with sensors at

50 MP or higher tend not to perform as well in low light but can deliver very large images with astounding levels of detail. ISOs in DSLR and mirrorless cameras tend to range from 100 to over 100,000. The higher you go, the more "noise" will be introduced into your image. Noisy images look less sharp and have a grainy texture, and while this can sometimes have a pleasing artistic effect, most photographers work to minimize noise. The ISO of film is fixed because its light sensitivity is built into the film when it is manufactured, and it typically ranges from 50 to 3,200.

Most of today's smartphone cameras will default to using an aperture setting below 2.8 and a low ISO (50 to 250, typically) and will automatically adjust the shutter speed accordingly to achieve a proper exposure. The quality of the images you can capture, especially considering their impossibly tiny lenses, is truly impressive. Earlier models seemed to max out at shutter speeds of around 1/250 second, which made capturing action challenging, but new models reach 1/1,000 second or higher with ease. So, if you see something moving quickly, don't be afraid to capture it with your phone. If you only shoot photos with your smartphone, it is worth downloading apps that seamlessly integrate with your phone camera to provide the creative control described in this article.

So, let's put this knowledge of aperture, shutter speed, and ISO to use with a few simple examples. First, a **bird in flight on a bright, sunny day**. This shooting situation requires a fast shutter speed of around 1/1,000 to 1/2,000 of a second to stop the bird in midflight and reduce the chance of blurred wingbeats. To achieve this while maintaining a noise-free image using an ISO setting of 800, an aperture of either f/4 or f/5.6 would be needed. Second, a **white-tailed deer standing still in early-morning light**. This shooting situation differs because the subject is not moving and there is less shooting light available in the early morning. Assuming the ISO remains the same at 800, and your f-stop stays in the f/4 to f/5.6 range, your shutter speed would likely drop to 1/60 or 1/125 of a second to allow for more light-gathering time. Finally, a **woodland stream flowing beneath a heavy canopy of summer leaves in the late afternoon**. A photographer in this situation needs to decide whether the image will freeze the moving water in place or allow it to softly blur across the sensor with a longer exposure time. If blurred water is desired, either a tripod or some other stable base (such as the top of a backpack that has been placed on the ground and leaned securely against a tree) is needed because a long shutter speed will introduce camera shake that can blur the entire image. Using your camera's 2- or 10-second shutter timer setting (smartphone cameras have this function, too) will prevent the act of pressing the shutter button from causing camera shake. Assuming, again, an ISO of 800 (or lower if you want to increase your shutter speed time), an aperture of f/16 or f/22 and a longer shutter speed of 1 to 3 seconds would be needed to beautifully blur the moving water. If freezing the movement of the water is desired, the shutter speed would need to increase to 1/125, 1/250, or even 1/500 of a second (depending on the speed of the water), which requires a much more open aperture of f/4 or f/5.6 to let in more light. Remember, it's late afternoon and you are shooting under a dense canopy of leaves, so to your camera's "eye" there is very little light. To maintain this shutter speed and aperture combination the ISO will need to be increased, perhaps as high as 3,200 or 6,400, so the sensor can more effectively capture the minimal light entering the camera while using this faster shutter speed.

Armed with knowledge of the give-and-take of light management that occurs between aperture, shutter speed, and ISO, we can now add the concept of **depth of field** (DOF), which is more accurately described as depth of focus. DOF is directly related to aperture choice, and that choice determines how much of your subject is in focus and how much of the focal plane extends through your subject from foreground to

background. Visualize a sheet of paper floating in front of you with the front of the sheet facing you and the back of the sheet facing away from you. This represents a very shallow focal plane because the area in focus is only as thick as the sheet of paper. Now imagine a cushion from your couch floating in front of you with, again, the front of the cushion facing you and the back of the cushion facing away from you. This represents an increased amount of DOF because the cushion is thicker than the paper. Everything inside this thicker focal plane would now be in focus. Now envision your entire house or apartment floating in front of you. Everything inside it would now be in focus. The aperture selection for each of these examples would be roughly as follows, sheet of paper: f/1.4–f/4; couch cushion: f/5.6–f/8; house or apartment: f/11–f/22.

DOF is a critical creative control in photography because our eyes will always initially focus on the portion of a photograph that is in focus. So, photographers can use DOF to direct the viewer's eye to immediate and then follow-on areas of a photograph by emphasizing and deemphasizing areas of an image with this selective focus technique. The term, of Japanese origin, used to describe the quality of intentional blur in out-of-focus areas of an image behind (and in front of) a subject is **bokeh**. It's a word that seems to have as many pronunciations as it does letters, but its generally agreed-upon English pronunciation is "BOW-ka." Bokeh is achieved using shallow depth of field (f/1.4–f/4) and is best when lenses are of the highest quality. The topic of bokeh commands much attention in wildlife and portrait photography.

In the realm of wildlife photography, where photographers prefer to use very expensive, super-telephoto lenses or prime (single focal length) lenses ranging from 400 to 800 millimeters (mm) with fast, wide apertures of f/2.8 or f/4, the shallow DOF and stunningly smooth bokeh separates and isolates wildlife from the often visually chaotic foreground and background elements found in nature while simultaneously helping photographers overcome the low-light challenges

Photos by Troy Gipps/MassWildlife

that often accompany the best shooting times for wildlife activity, dawn and dusk.

Similarly, portrait photographers can draw crisp attention to the faces of their subjects or a portion of a subject's face, such as their eyes, while gently blurring other portions of the subject or completely blurring distracting background and foreground elements by using portrait-length lenses (50–90 mm) and wide apertures in the f/1.4–f/5.6 range. There are a few extremely expensive portrait lenses that have a maximum aperture of f/1.0! They deliver the best possible bokeh, but dedicated portrait photographers can also get stunning results from 85 mm portrait lenses with maximum apertures of f/1.2 to f/1.4. If you are only shooting photographs with your smartphone, see if the camera has a portrait mode. If so, take a portrait using the normal shooting mode, then take the same image using portrait mode. You'll notice the difference right away. All the background detail present in the normal mode image will become a pleasing blur of non-distracting color, and many cameras allow you to further blur the background by adjusting the f-stop digitally after the shot has been taken.

Macro photography is one area where photographers battle *against* shallow DOF, which is exaggerated by the optical formula of macro-specific lenses that achieve a 1:1 magnification rate or greater. Magnification of 1:1 means the image captured on the camera's sensor is the same size as the subject in real life. In the macro world, everything is amplified: camera shake, light loss, and the narrowing of DOF. This makes it very difficult to get enough of your image in focus to tell its story. Think of a spider on its web. It's a tiny subject. Its web may be moving slightly due to a breeze in the meadow. You must get in close to fill the frame with the spider so you can capture detail that people don't usually see, and being in that close exaggerates camera shake. In fact, you may even see the result of your own breathing through the viewfinder as you frame your image. And you'll likely prefer to shoot these images in the early morning or late afternoon to avoid the glare and blown-out highlights that typically accompany midday light, which could require the use of a speedlight (flash)—preferably designed for macro photography—to make shooting images at tighter apertures of f/11–f/22 (to increase DOF) possible without pushing your ISO too high. An entire article could easily be written about this topic, but there is one simple takeaway from this shooting circumstance that can be applied not only to macro photography but to many other shooting situations. Think back to the sheet of paper floating in front of you and how I referred to it as a focal plane. Now think of the spider on its web. The web, too, is a focal plane. So, if you wanted to capture a photo of the spider in the center of its web and have the spider and the entire web in focus edge-to-edge, you need to perfectly align in parallel the focal plane of your camera's sensor with the plane of the spider's web. If you cant your camera forward or backward or side to side, even a little, the edges of the web will not be in focus, and the edges of the spider might not be, either. Conversely, if you wanted to emphasize the spider and let the web fall from focus both in front of and behind the spider, you need to change your shooting position to face the side of the spider's body, to align the focal plane of your camera's sensor with the imaginary sheet of paper that runs through the center of the spider's body or along the side that faces your lens (this choice will depend on how much DOF you can achieve with your selected aperture). Keeping the alignment of focal planes in mind, whether striving for shallow DOF or fighting against it, will enhance your images.

Over the past year, MassWildlife's Outreach and Education section, where I work, has run several photo contests on the agency's Instagram and Facebook accounts, asking followers to submit their best wildlife and outdoor recreation images. To conclude this article, I will review some of the winning and most popular images and describe why I think these images were chosen by the public.

Photo © Dan Prosser

Canon EOS 80D, Sigma 60–600mm, f/18, 1/1600 second, ISO 5000

Wildlife in Action

The hallmark of most successful wildlife photography is the capture of natural behavior in action. The image of a **bobcat pouncing** to capture prey (presumably a rodent hidden beneath the dry grass) was selected by the public as the winning image in the Wildlife contest category. It was chosen because it captures behavior that most people never see in person, but it is also very good from a compositional standpoint because the bobcat occupies the right side of the frame and the left side of the frame is left open, which gives the bobcat space to look at its prey and jump as we visualize the moments following the pounce. In short, with this composition we can see what is happening without any visual distractions and we have the visual space to imagine what is about to happen. The photographer reports that this was a spontaneous shot, taken from a parked vehicle, which, by the way, makes a quite effective blind to shoot from, because animals often don't view parked vehicles as threats, so they continue with their natural behavior.

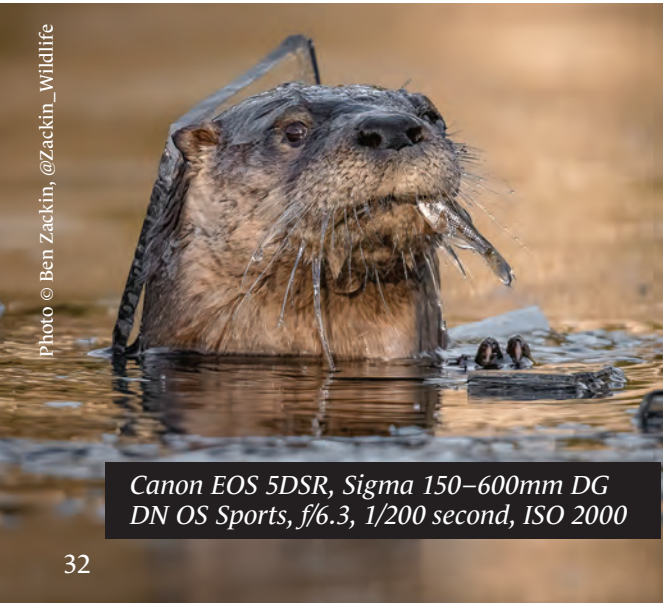

Photo © Ben Zackin, @Zackin_Wildlife

Canon EOS 5DSR, Sigma 150–600mm DG DN OS Sports, f/6.3, 1/200 second, ISO 2000

Another favorite in the Wildlife category was this image of an **American river otter feeding on a small fish**, photographed as the otter surfaced through thin ice. One of the most unusual and striking parts of the image isn't the otter or the half-eaten fish, but rather the piece of ice that is standing vertically behind the otter's head. There is also very good subject isolation due to the smooth background and foreground bokeh, which focuses the viewer's eye on the otter while still telling a brief story about its habitat and feeding behavior in winter.


Photo © Rick Kramer

The image of a **red-winged black bird calling** is also a great example of how smooth bokeh, and the absence of distracting backgrounds, can focus the eye where it needs to be, on the subject. But this photo was chosen as a favorite for a more important reason. It depicts a bird calling, with its mouth open and its wings flared downward as the sound of its call rings out over the marsh. Images of bird behavior, such as calling, feeding, or flying, will almost always stand out to viewers more than images of birds quietly perched.

These three wildlife images also reinforce the importance of ethical wildlife photography. When a photographer gets too close and disturbs or disrupts an animal's behavior, the resulting image will always be something less than a shot that captures natural behavior.

Wildlife Portraits

Wildlife portraits like the following three images appeal to viewers because they provide an up-close look at wildlife as they look back at us. The image of **three black bears cubs** was a favorite in our contest because there are three cubs together in a single frame and they are all looking at the camera with no distracting elements in the composition. It's the type of image that is not easy to get and it provides a window into the world of these cubs. The moderate bokeh behind and in front of the bears also helps to focus our eyes on the bears' eyes, which enhances the image's success.

Porcupines spend most of their time way up in the trees feeding and keeping safe from predators, so it's not often that a person gets eye-to-eye with a **resting porcupine** (see page 34). In addition to the nicely blurred background bokeh, the porcupine's long, light-colored hairs seem to match the color and pattern of the many small branches around it, which provides great visual texture to an already very pleasing image. We also see that the right side of the frame is left mostly visually open, which gives the porcupine space to look off into the canopy. If you are familiar with photography, you might be wondering why I haven't previously mentioned the "rule of thirds," which is often taught in introductory photography classes as the benchmark of composition. While I don't

Canon EOS 7D Mark II, Canon EF 100–400mm IS II USM at 227mm, f/5.0, 1/200 second, ISO 640


Photo © Henry Godek

Canon EOS 5D Mark IV, Canon EF 100–400mm IS II USM at 400mm, f/5.6, 1/60 second, ISO 4000

Photo © Christina Radcliffe

disagree with its basic premise (which I will describe below), I think it's better to first evaluate what you are seeing through your viewfinder or on your screen and consider the subject's relationship to the other visual elements around it, and then think about what the viewer's eye will do when it sees your image. The left and right sides of any image are like walls, the top of the image is a ceiling, and the bottom is a floor. Keep that in mind when composing your photographs: The visual elements in your photos need room to breathe. The bottom line with this image is, if the porcupine were on the right side of the frame, it would look like it was facing a wall, and if that were the case I don't think it would have been selected as a favorite. As for the rule of thirds, it dictates that you visually divide up your image through your viewfinder with two evenly spaced vertical lines and two evenly spaced horizontal lines that create nine rectangles of equal size, like a grid. The rule states that the central visual point of the primary subject of your image should be placed at one of the line intersections, and any linear elements in your image should be aligned with the grid lines.

But the rule of thirds doesn't always predict what is and is not a successful image, which is readily apparent when you look at this image favorite, a **red-morph, eastern screech owl resting in a tree cavity**. The owl is placed in the center of the image, but it works here because the primary shapes found in this image, ovals, do a great job of framing the owl. The owl's eyes are also wide open and looking straight ahead, so the viewer's eye goes to the owl's eyes first; then to the color, pattern, and texture of its feathers; and, finally, to the texture and pattern of the tree bark, and all these elements are connected by shape repetition.

Fishing

There are as many ways to photograph fishing as there are fish in the sea. This image of an **angler silhouetted against a mid-autumn landscape** in Western Massachusetts is as much about place and season as it is about fishing. The shot was taken with a fast shutter speed of 1/1,000 second. The reason why the shutter speed was so high and why the foreground and angler are silhouetted (underexposed) is because the camera's light meter selected

Photo © John Randell

the higher shutter speed based on the light reflecting off the treeline on the far side of the lake and not the foreground, which exposed the treeline properly but left the foreground underexposed. This image was selected by our followers as a favorite because it allowed them to imagine themselves in this beautiful setting. This image says "fishing" without the need for further visual detail.

The next fishing image (see page 36), an **angler fly-casting**, which was selected as the winner in its category, is a great example of why color is sometimes not needed and how, in fact, the absence of color can enhance an image's impact by stripping it down to its most basic elements. The black-and-white, high-contrast image processing used by this photographer makes the angler's fly line visually "pop" against the darker background, with its moderate bokeh, thereby capturing the essence and beauty of fly-casting; no color needed.

Photo © Amy Lavallee

iPhone 13 ProMax, Ultra-wide 13mm lens, f/2.2, 1/1,000 second

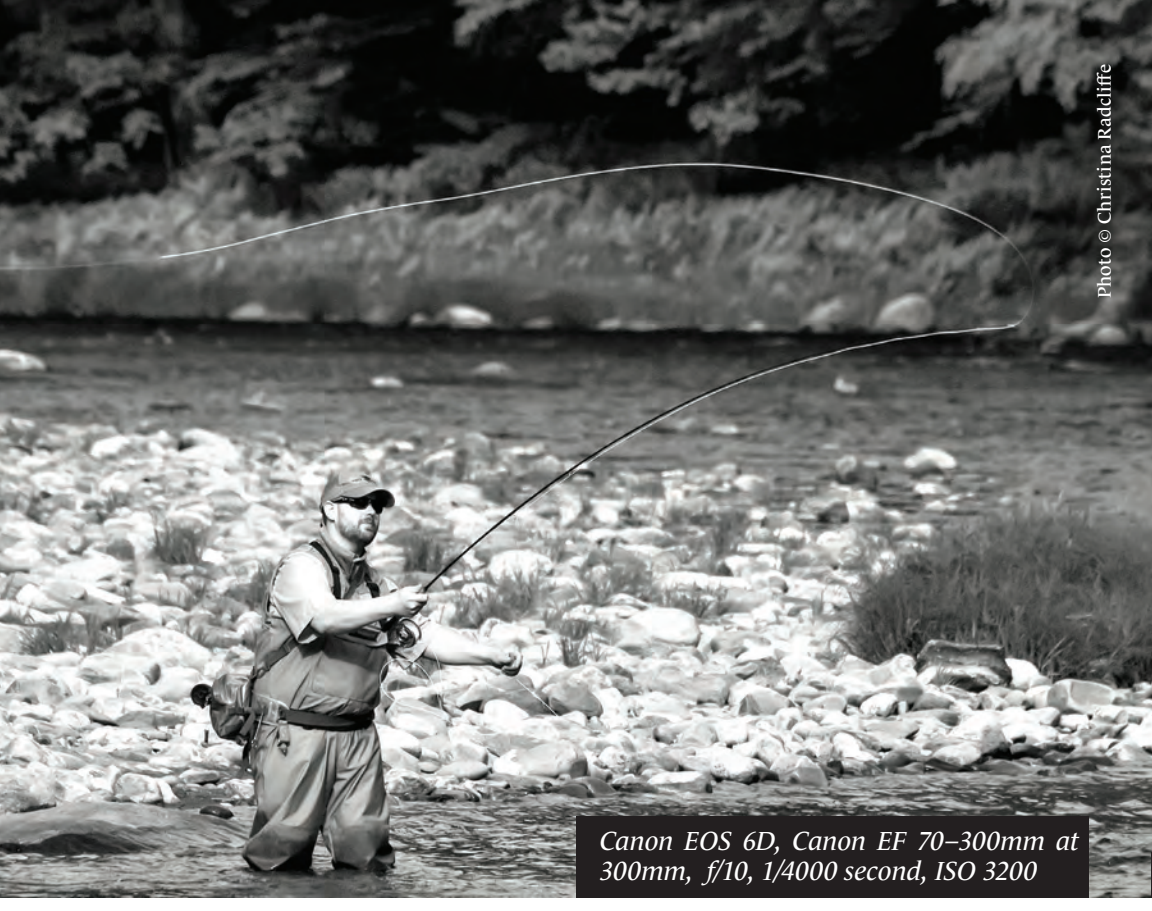

Photo © Christina Radcliffe

Canon EOS 6D, Canon EF 70–300mm at 300mm, f/10, 1/4000 second, ISO 3200

Outdoor Recreation

Finally, in the outdoor recreation category, we have two images created with very different camera settings, but they equally demonstrate the value of the rule of thirds and good compositional lines in an image.

The shot of **four kids sprinting off the end of a paddleboard** into Tully Lake in Royalston is a quintessential New England summer-fun image. The photographer's high shutter speed captured a walk-on-water moment where the energy and excitement of this athletic balancing act is captured in each of their expressions and in every droplet frozen in the frame. The image is also framed nicely by the bright highlights in the sky at the top of the image and the water at the bottom of the frame, and there is space for the action to play out on the right side of the frame. The bulk of the subject's "weight" (i.e., all four kids) is also placed in the lower-left-third of the image; hence, it follows the rule of thirds, even though the older girl to the right is where a viewer's eye looks first.

Our final image of **friends returning from a surfcasting adventure** on Cape Cod beautifully captures low light and deep color—without the subjects being fully silhouetted—and it clearly shows the value of placing primary subjects in an outer third of the frame, while leaving space, in this case, for the viewer's eye to follow the curved line of the sandy path into the foreground while imagining the fishing stories that were being told.

Final Frame

I hope this article has shed some light on what it takes to take a good photograph. If you are new to photography and find yourself intimidated by the technological

Photo © Katie Barnes/Dreamlove Photography

Canon R6 Mirrorless, Canon 24–70mm, f/3.5, 1/1,000 second, ISO 640

Photo © Amie Medeiros, @capeimagesbyamie

Google Pixel 6 Pro

complexities of today's cameras, keep in mind that photography is much less about the camera and much more about how you see the world and the story you seek to capture and share with others. After all, a camera is just a piece of technology that is placed between you and your experience. As for a final word on this subject, I would be remiss if I didn't encourage all photographers to *read their camera manuals*, because it is truly amazing what cameras can now do.

About the Author

Troy Gipps is the editor and art director of Massachusetts Wildlife. *He got his first 35mm camera when he was 15 years old, a Minolta X-370, and he has been a photographer ever since.*

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This image may at first appear to be an acrylic or oil painting, but by setting a slow shutter speed and panning up during the shot the photographer's digital sensor was "painted" with the vibrant autumn colors of this Massachusetts wetland. To learn more about the fundamentals of photography, see page 26. Photo © Troy Gipps, Canon EOS 7D Mark II, Canon EF 70–200mm IS USM at 165mm, f/22, 1/3 second, ISO 100.