

Outdoor Photographer®



GUIDE TO Modern Printmaking

TEXT & PHOTOGRAPHY BY JASON BRADLEY

- Considering the value of prints in the digital age
- Understanding color spaces, profiles and device calibration
- Soft-proofing and configuring your print settings for optimal output
- A guide to selecting paper and alternative media options for photographic prints



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Considering the value of prints in the digital age



I believe printing and hanging your work is the most valuable part of any photographer's workflow.

Like many who make their living with photography, my income is generated in several ways. One is by teaching Lightroom and techniques in digital workflow, and another is working with photographers to develop their images and produce

fine-art archival pigment-ink prints—which is a fancy way of saying I run a digital print lab. Through these two endeavors, my experience has been that learning how to print well, which is a somewhat subjective thing, isn't easy.

Subjectivity aside, by “print well,” I mean knowing how to pay attention

to detail and tone, to shadows and to highlights, to print with consistency and predictability, and with an understanding of how an image may or may not translate onto a certain medium. I'm referring to having clarity about the vision you have for your work, and having enough command over the

tools and technology at hand to successfully translate that vision so that your first print is as successful as your hundredth.

Again, it's not easy. It takes patience, technical knowledge, trial and error, and commitment. Nonetheless, I think it's the most important phase of the photography workflow. The print is, as Ansel Adams once famously called it, the photographer's "performance."

So, with due reverence for the performance, this article is part one of a series of four articles on how to print with modern tools. To kick things off, we'll first examine the usefulness of printing in today's virtual, computer screen-driven world. Following articles will introduce you to the tools and concepts needed to print consistently and predictably, and the final article will review the types of paper and media available for digital printing.

Whether you print often and want to improve your skills, or don't print and need to know where to begin, let me suggest you start, as of now, by thinking about what kind of performance you want to create.

The Value Of Printing

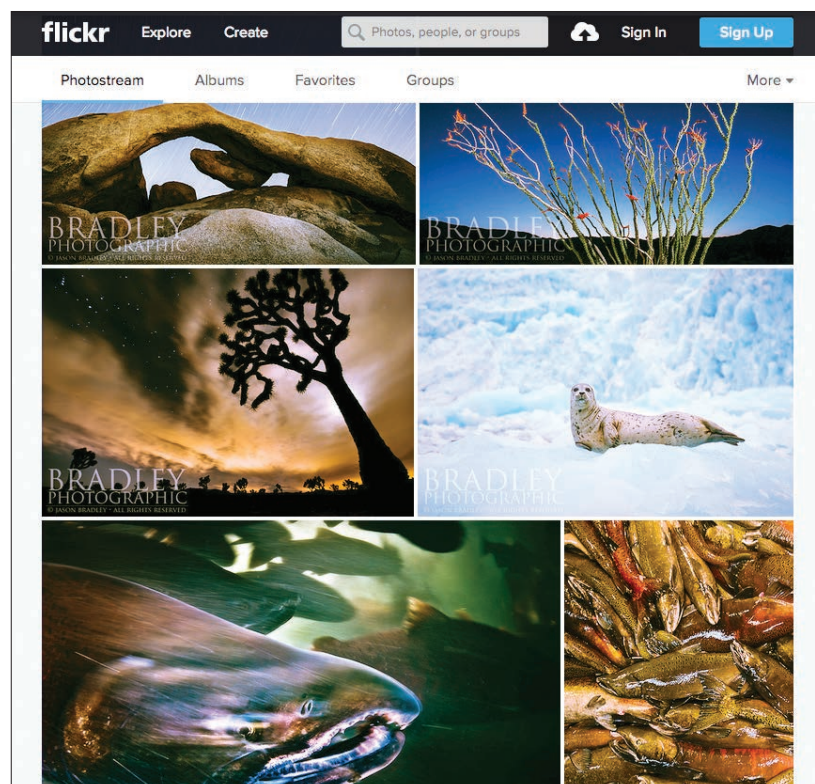
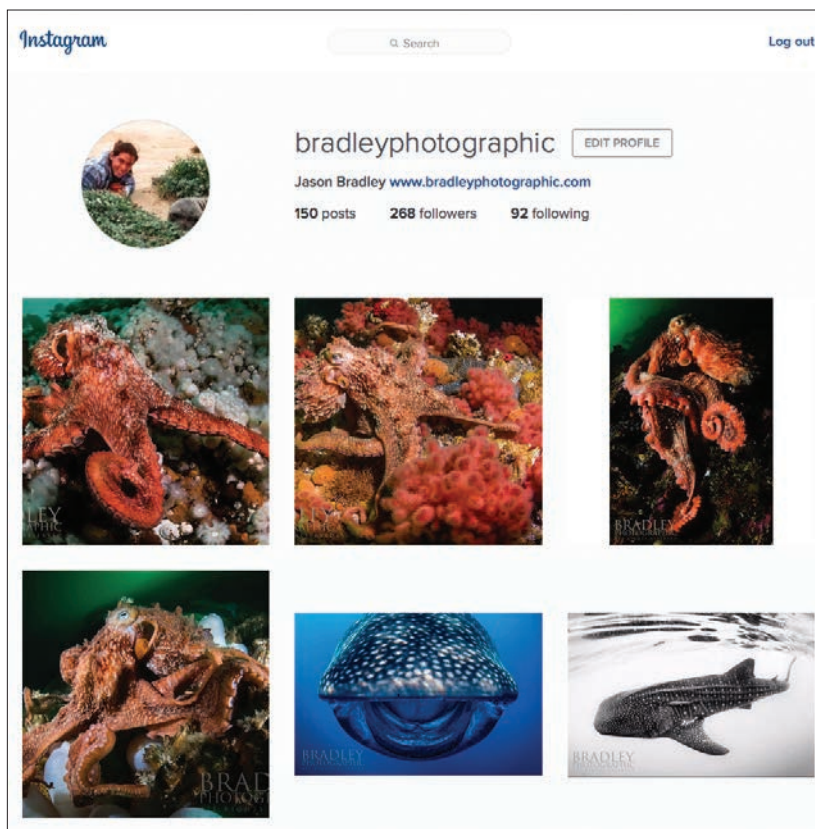
A photographer's job is to make a print, right? Isn't that the end goal? Create a negative, digital or otherwise, and then print? Well, actually, not really, not anymore. Imagine, if you will, a 20-something shooter who's hot with his or her camera—maybe that's even you. He has thousands and thousands of followers on Instagram and Flickr, but never in his life has he made a print. Is he, or is he not, a photographer?

For him, the craft of photography is about the capture, the shared file. In step with the digital photography culture, he produces many, many images. His workflow is void of printmaking because there's no requirement or motivation to do so, but a photographer he is nonetheless. For better or worse, printmaking isn't necessarily the job or the requirement for the modern photographer, as it has been historically.

So, the question is, why print? What's the importance of making a print in an era that doesn't require it? Even though the answers to those questions are likely as plentiful as there are photographers, let me attempt to distill a few.

Artisan Printmaking

"Artisanal" language in advertising has become popular, to say the least. McDonald's even has a sandwich called the Artisan Grilled



Technology has provided us with the means to show images and share them virtually with friends, colleagues and clients, but do computer screens and mobile devices truly show a well-polished, finished photograph?

Chicken Sandwich. I like a cheat meal just like the next guy, but McDonald's? Artisanal? Try Googling the keywords "artisanal parody," and you'll find hilarious videos on artisanal water making, artisanal firewood and artisanal pencil sharpening.

The fact of the matter is that such language has made its way into our culture to the point of parody because there's a cultural need for it. People value craftsmanship. They value the rare thing, the diamond instead of the quartz. Yes, we live in a McDonald's world, but there's also The French Laundry (a famous restaurant in Napa serving finely crafted French-style dishes with American influences).

The very act of printmaking is the act of highlighting the rare thing. Making prints forces us to sift through our archive with more care and consideration, to select that image that's truly worthy—worthy beyond the social-media post. Worthy enough to analyze its details in Photoshop or Lightroom, to pay attention to things like edge sharpness, removing chromatic aberration, noise reduction and spot removal—things that are less necessary with low-resolution viewing. Worthy enough to print, to frame, to add my signature to, to hang on my wall and to properly light, because it best represents my vision for my work.

Making prints forces us to scrutinize our work more intimately, and if you have any interest in getting better at photog-

raphy, such scrutiny can only help. The daily social-media post is just inherently less rare. I think people appreciate, even yearn for, the finely crafted, rare thing.

The Tangible Vs. The Virtual

Digital information isn't merely short-lived as it comes and goes on our computer screens—it leaves our memory faster, as well. There's real science that points to the phenomena that what we see digitally doesn't last as long in our memory as things on paper. Admittedly, I'm making a correlation between science and the photographic arts, but there have been countless studies showing that when a person reads text on paper, he or she is able to retain and comprehend that information longer than when the same text is presented on a computer screen.

There's something about the tangible that triggers a physical and emotional response that doesn't happen on computer screens. And this physical and emotional response is what elicits access to the right triggers and synapses in the brain that are needed for long-term memory pathways. Comprehension isn't absent when reading on computer screens, it's just not as long-lasting.

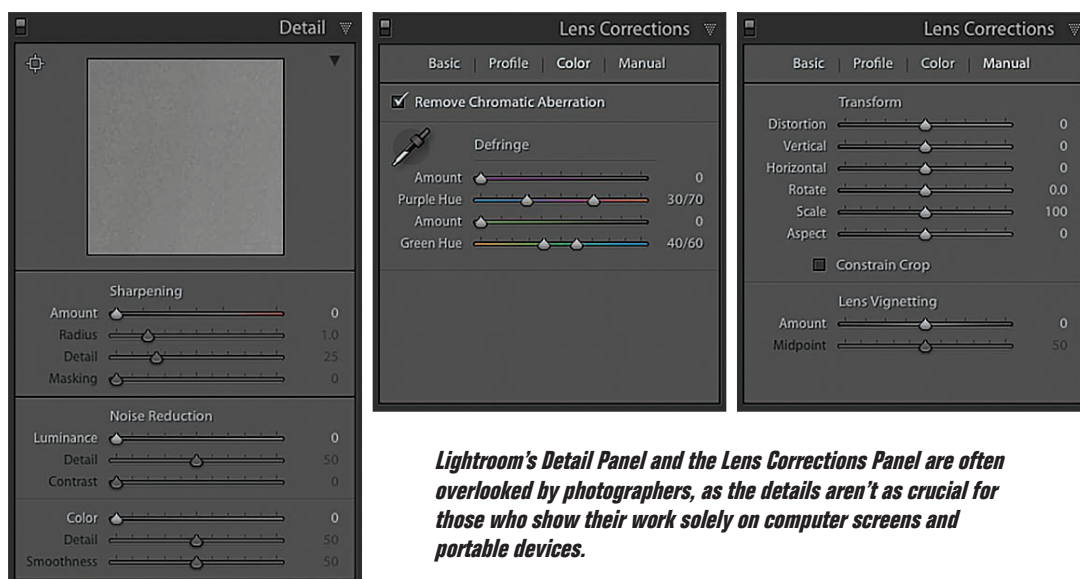
For me, holding a print in my hand is a much more rewarding experience than just looking at an image on the screen. The computer display holds the image's potential, but the print is where that potential is realized. Images resting on

my hard drive are forgotten more easily than those that are framed and hung, and seen over and over; these are continuously thought about and are explained to others. Prints are, as the science suggests, an enduring experience.

Archivability

In addition to the durability of the personal experience, prints also have more inherent archivability—they have the potential to live longer. A print made on the right paper with the right ink can last 100 years or more under the right condition, whereas anything digital runs the risk of becoming obsolete. Storage devices over the last 20 years have changed from floppy disks, to Zip drives, to CDs and DVDs, and from hard drives to solid-state drives. Oh, yeah, and here comes cloud storage options.

If today's computers can't read storage devices from 10 to 20 years ago, how do we know that in 30, 50 or 100 years from now we can still access JPEGs, the files on our hard drives, our raw file formats, and the developmental metadata we made while processing our image with today's version of Lightroom? Have you heard of the new BPG (Better Portable Graphics) image format yet? I've seen a few articles saying it's the format that may finally replace the JPEG. We have no idea what we'll be able to do and not do that far ahead, but we do know that anything we print will



Lightroom's Detail Panel and the Lens Corrections Panel are often overlooked by photographers, as the details aren't as crucial for those who show their work solely on computer screens and portable devices.



Prints that last don't always have to be fine-art prints. Services like Blurb (you can publish to Blurb directly from Lightroom) or Chatbooks can create and send you bound books of images that normally would just sit on Instagram or your hard drive.

last, and will look the same decades from now, if handled with care.

Why Buy A Leica, If You Already Have An iPhone

Once I had a client submit an image to me for printing that was captured with a Leica S. The image was technically precise, the exposure was good, everything was sharp, the ISO used was low, and the client asked me if I thought the file would hold up if we made a 16x24-inch print. Now, for those of you who may not be in the know, the Leica S isn't a cheap little camera. Leicas are well known as the pinnacle of optical engineering, and the Leica S body alone is over \$20,000.

Yet, there was a question of whether the file would hold up for what I consider a medium-sized print. Of course, I responded loudly with a, "Hell, yeah,

it will!" and made it clear that the file can go much larger than that. I don't tell this story to disparage my client. Instead, the story is an indicator of how many photographers have come to understand camera and photo quality.

If looking at images solely on computer screens, through social media, through email and websites, where images are no wider than, say, 1,000 or 2,000 pixels, how can one distinguish the difference between the image quality of a top-quality camera and lens versus a point-and-shoot camera, or even an iPhone, for that matter? If our concept of camera quality is only conceptualized through the prism of price and megapixel marketing, or through what the highest achievable ISO is, then how do we get a feel for what our tools are capable of? The print! Are you getting it now?

The value of the print is, ultimately, the value of the print. It's in the eye of the beholder, as they say. You may be a 20-something Instagram sensation, or you may be shooting black-and-white 120 film that you process yourself in your personal darkroom. Either way, the print celebrates the rare gems of our photo archives; it allows us to scrutinize our work more intimately. Prints are a tangible experience that we connect with on a deeper level, and their potential is that they'll outlast the cameras, and the computers that created them, by far. For all these reasons, I believe printmaking is the most valuable phase of a modern workflow, and I encourage anyone reading this to do it more, to share your art more with people in person, and hold up the final vision of your work as high as you can.

Understanding color spaces, profiles and device calibration

Part One focused on the value of printing in our digital era, and here, with Part Two, I'd like to jump into distilling the complicated practice of digital printing—or, at least, to jump into distilling the theory behind the practice.

Digital printing workflow is all about consistency. The thing with analog printing, especially printing that requires dodging and burning, and masking, is that no two prints are exactly alike. Digital printing, when practiced well, eliminates the unpredictable nature of analog printing. Once an image has been developed and proofed in Lightroom, Photoshop or elsewhere, printing becomes a matter of hitting “Print”. Admittedly, it's not as easy as that, but compared to building a darkroom, mixing chemicals, developing and fixing paper, it kind of is. Making the 100th print versus the first should be, theoretically, the same—even if you print on different printers or on different papers—as long as you know how to practice a workflow that supports such consistency.

Consistency also refers to knowing that what we see on our computer screens will match what comes out of our printers. It's true that the criteria for consistency can vary, depending on how critical your eye is, the requirements of your audience and clients, your budget, and what equipment you already may be invested in and using. Considering all that, I suggest your goal should be to create consistency relative to your needs. Whether your standards are high and you need perfection because

your clients and studio demand it or you're fine with relative accuracy (most are, as I am), the secret to consistency lies in training all the hardware along your workflow chain to speak to one another.

ICC Color Management Basics

All of the cameras on the market today, and all of the computer monitors, portable tablets, printers, printer inks and photo papers, render tones differently. Some can reproduce a wide range of tonality and color, while others are limited. Adding to the complexity, some devices use one language to communicate color, while other devices use a completely different language.

Since different devices in our workflow chain speak different languages, we need a standard that enables one device to understand another, allowing us to manage colors in our images when moving them from device to device. Luckily, such a standard language exists, created by the International Color Consortium (ICC). In a nutshell, the ICC is an organization that was formed in 1993 to help solve the problem of digital color reproduction, and it did so by creating a vendor-neutral color management system. Referred to as ICC Color Management, the system is practiced simply by integrating ICC profiles into our workflow.

The first step in color management is knowing a few terms related to device calibration, including the difference between a color space, a color profile and an ICC profile. From there, we can talk about how

to integrate ICC profiles into our printing workflow.

Color Spaces. Color models such as RGB (red, green, blue) or CMY (cyan, magenta, yellow) can be mixed together in endless ways. To define color in a digital environment, red, green and blue need to be quantified numerically. Color spaces provide a way to do this. Adobe RGB, sRGB and ProPhoto are commonly used color spaces for photographers (Figure 1).

Color Profiles. A color profile essentially is a color space attached to an image. For example, Adobe RGB and sRGB are color spaces, but if I embed one of them into an image, that space is then the image's color profile. Our computers and software such as Lightroom need to reference a color profile in order to define color and tonality as we work with our photos.

ICC Profiles. An ICC profile is a color space that characterizes a specific device, such as a monitor, printer or camera, and associates that space with a vendor-neutral industry-standard set of colors defined by the ICC. This process of characterization is also called calibrating. Figure 2 shows my colorimeter, a monitor-calibrating device, analyzing my monitor as software projects colors at different shades and brightness values. After my monitor has been calibrated, all colors and tones will be displayed through the ICC profile created during the calibration process. ICC profiles further define a mapping protocol between the source color space and a profile connection space. This allows for

BEFORE AFTER



Color rendition before and after display calibration. Calibrating your display is one of the most important steps in creating a consistent digital printing workflow.

efficient communication and translation of color when moving from device to device in a given workflow—as long as ICC profiles are used all along the workflow chain.

Calibration And The Practice Of Color Management

Even though all of your devices need to be profiled to practice an ICC Color Management workflow, that doesn't mean you need to invest in the tools and the time required to do it all yourself. In fact, I suggest you don't do that. All you—and the vast majority of photographers out there—need to do in order to start experiencing some degree of consistency is to calibrate

your monitor and begin incorporating ICC print profiles into your routine.

Personally, I've owned and used the X-Rite ColorMunki Display. I think it's a great moderately priced calibrator and does everything one would need to obtain a good profile. With that said, I also like and suggest the Spyder5PRO or the Spyder5ELITE by Datacolor.

Here are my top tips for calibrating your monitor:

- Calibrate once per month.
- Use a room with consistent ambient light that's moderately lit and has no direct sunlight hitting your monitor.
- Use your monitor calibrator to measure the room's ambient light when creating your profile.
- Use gamma 2.2. Not all calibrators do this, but it's a good feature if you're working in places with drastically changing light conditions.
- Set the brightness at 80-100 cd/m2. Monitor calibrators that measure your room's ambient light likely will suggest a brightness value based on the amount of available light in the room.
- Use white point D65. This is generally the go-to white point, but if you're certain of the color temperature that's lighting your prints, adjust accordingly. Using the

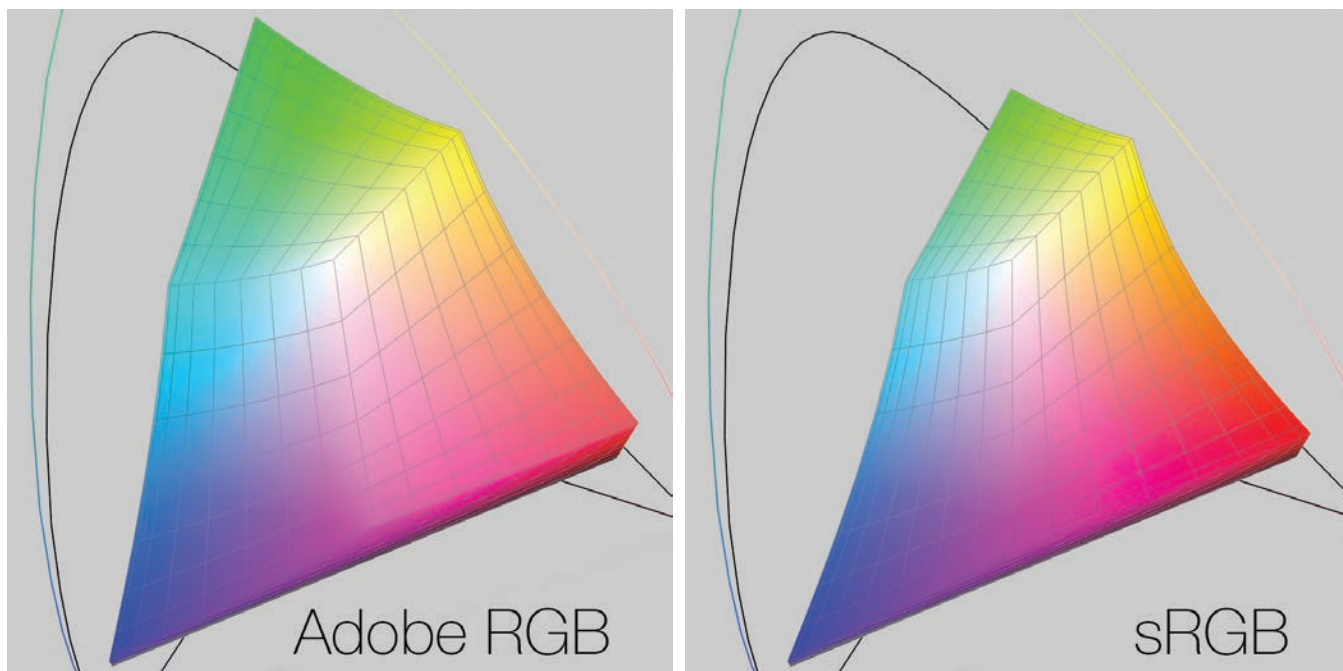


FIGURE 1: Adobe RGB and sRGB are commonly used color spaces that assist computers and programs in defining the parameters and range of color. Spaces can be big or small.

monitor’s “native” white is also a good choice if your colorimeter doesn’t give you the option of choosing a custom white point.

After calibrating your monitor, which may look weird to you at first because you’re seeing colors displayed in a new way, use the same monitor calibrator to verify your calibration so you know you’ve created a good profile. Different colorimeters do this differently, so refer to your manual to get instructions on how to verify the quality of your profile.

Integrating ICC Print Profiles

Calibrating your monitor is essential, but I can say with confidence that consistency isn’t possible without the use of the ICC Print Profile. While monitor calibrators characterize your monitor, printing profiles characterize your printer, your ink and the papers, canvas or other media you’re running through your printer.

To create your own custom print profiles, you’ll need to invest in a spectrophotometer like the one shown in Figure 3. You’ll need to make a neutral target print by turning off all color management in your printer driver, and then

you’ll need to scan all of the individual colors on the target. And, yes, you’ll need to do this for every paper you use. It’s time-consuming to do this, which is why I suggested earlier that you don’t need to. If you want to, and like “geeking out” on such things, scan your target prints to your heart’s content, but in the spirit of keeping your life easier, let

me suggest a couple of alternatives.

The easiest, most affordable solution is simply to use the printer profiles supplied by your paper’s manufacturer—they’re free. I don’t know of any paper manufacturers today that don’t make and offer ICC profiles for the media they sell. They offer profiles for all popular photo printer models from Canon and



FIGURE 2: As you calibrate your monitor, it will display an array of different colors at different brightness values that are analyzed through the colorimeter and accompanying software.



FIGURE 3: A spectrophotometer can be used to scan a target print to create a profile for a specific printer, ink and paper combination.

Epson, and most from HP. Simply go to the manufacturer's website and look for "ICC profiles," or Google the name of the paper you're using followed by ICC profiles (e.g., Canson Infinity Rag ICC profiles).

You also can use a service to create a custom profile for you. I think this a great way to go. It's not free, like using the manufacturers' profiles, but they're customized to your specific printer and thus usually will provide you with a more accurate profile to work with. CHROMiX, Digital Technology Group and IT Supplies are a few companies that offer services for creating custom profiles. The good news is that they're not that expensive, starting at around \$30.

As you print files through Photoshop,

Lightroom or another program, your image will need to be converted to the printing profile before you hit "Print." In the next article in this series, I'll go into more step-by-step explanations of the print process, but before that, Lightroom, Photoshop or another program needs to be able to find the profile that we've downloaded or has been given to us. It's simply a matter of placing the profile in the correct folder. Below is a set of directions, or paths, where you should place your ICC profiles, depending on what computer platform or operating system you're using.

For Mac OS X, place profiles in Library > ColorSync > Profiles, from your home directory

For Windows Vista or later, go to

Control Panel > Color Management > All Profiles > Add

For Windows 2000, the correct location is C: > WINNT > System32 > spool > drivers > color

Now that we have some foundation in the theory and practice for creating consistency with digital printing, the next step is to start doing it. So, I humbly ask that you stay tuned to the next issue to learn more. Believe it or not, there's a bit more to know in addition to putting the right profile in the right folder. I'll provide a step-by-step workflow illustrating a print workflow through Lightroom. Until then, begin by calibrating your devices, and get them ready to jump into good color management practices.

WORKFLOW

Soft-proofing and configuring your print settings for optimal output



An image from Indonesia's Komodo National Park that's on deck for printing in Lightroom's Print Module.

In the previous installment of this four-part series, I talked about creating consistency through calibrating our devices and introduced you to concepts on how to practice ICC color management. The goal was to provide a foundation for printing with a sense of control, by incorporating ICC profiles into your workflow. In this article, I'll focus more on the how-to of it by covering the important steps and objectives of a typical printing workflow, the keyword here being important.

A typical printing workflow is less about the printer and software you choose or whether

you use the manufacturer's print driver versus a third-party RIP (Raster Image Processor; see the sidebar for more on this topic). Instead, the steps I'm referring to are more universal, and they should be noted regardless of the aforementioned. Most importantly, both the location of, and the configuration of, the settings as you print will vary depending on the platform, the printer and the software used. So, here, I'll concentrate on the issues that I deem to be "important stuff" and that remain the same from one printing workflow to another.

Step 1: Soft-Proofing

After a file has been developed and is ready to print, don't hit the print button—yet. I suggest that you soft-proof first. A hard proof is a print we can hold and look at to see if what we've made works, while soft proofs are something we can look at before hitting "Print." Specifically, a soft proof can tell us whether we have color out of gamut and, thus, offers the opportunity to make any adjustments before printing.

When referring to out-of-gamut colors, I'm referring to colors in your file that your printer can't reproduce (Figure 1). In my last article, I talked about how devices in our workflow chain reproduce color differently. Even though your display can show you a particular shade of blue, that doesn't mean your printer can make that same blue. Soft-proofing allows us to ascertain if such a discrepancy exists between file and print. It tells us what colors are "out of gamut," and it shows where in our images the out-of-gamut colors are, providing us with the road map we need to correct the problem. Here's how it works when working in Lightroom.

1. While in the Develop Module in Lightroom, look for and check the Soft Proofing box in the toolbar (Figure 2).
2. Look for the Soft Proofing Panel in the upper right of your user interface. Then select the correct printer profile for the printer and photo paper you're using (Figure 3). If you're looking for your printer profile for the first time, click on Other and find your profile from a selection larger than the one sampled in Figure 3.
3. Choose a Perceptual or Relative Intent, located below where you chose your profile. Without getting too technical, rendering intents are different methods for moving color from the computer to the printer. For the most part, Perceptual is where you'll want to be, but you can switch back and forth to see which looks better. Ideally, you'll see no change at all.
4. Click on the small Show Destination Gamut Warning icon. Colors that are out of gamut will then show as red (Figure 4).

TIP: Check out the previous article in this series to read more about printer profiles and how to load them.

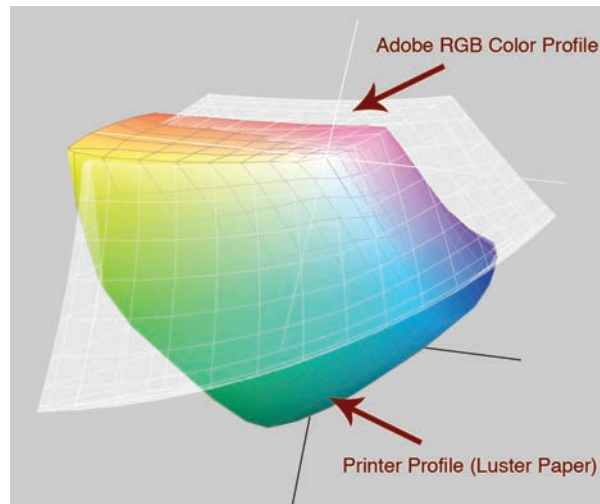


FIGURE 1: Here's a screenshot of a printer profile set inside of a display or monitor profile. As you can see, they're different. Color from your file to your monitor to your print is different and can't always be reproduced when converting to a printer profile.



FIGURE 2: Check the Soft Proofing box to inspect your image file for out-of-gamut color.

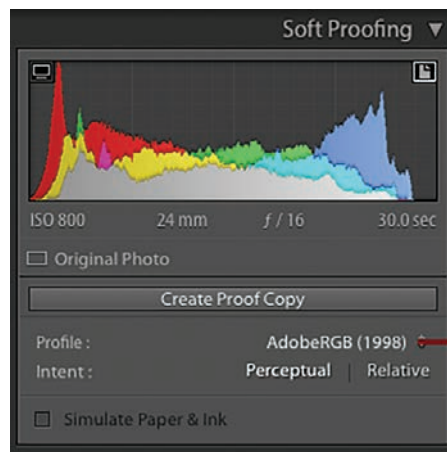


FIGURE 3: Choose the printer profile for your printer and the photo paper you're using.

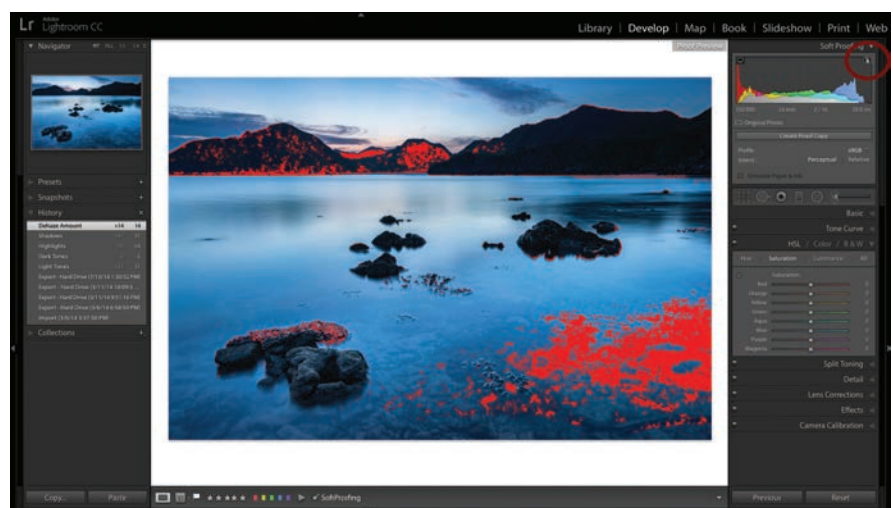
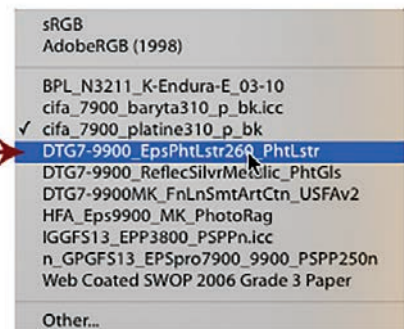


FIGURE 4: Activate the Show Destination Gamut Warning to identify your out-of-gamut color.

Step 2: Correcting Out-of-Gamut Color

Needless to say, you can print without soft-proofing. The thing is, if you print a file with out-of-gamut color, that color will be interpreted—which is a fancy word for guessing. Soft-proofing, thus, provides control, consistency and predictability.

When fixing out-of-gamut color, the goal, regardless of approach, is to change the color to something that's printable without the need for interpolation. The trick to doing this is to steer clear of global adjustments, meaning, don't use, say, the Saturation slider in Lightroom, as it will shift the saturation of all the colors in your file, not just your out-of-gamut ones. Thus, think in terms of performing localized adjustments.

1. One way to change color is to change its hue. While in Lightroom's Develop Module, open the HSL Panel, and click on the Hue section. Next, select the Targeted Adjustment tool, which turns your cursor into a crosshair. You then can click directly on your out-of-gamut color and click-and-drag your mouse up or down to change the hue of that color (Figure 5). Of course, keep your out-of-gamut clipping warnings active to see the red gamut warning fade or disappear as you go.
2. You also can change a color by changing its level of saturation. With this approach, do everything almost exactly the same as in the last step, but instead of selecting the Hue section, select Saturation. Then, focus on desaturating your out-of-gamut color, which I've found to be the more effective way to bring color into gamut. Alternatively, you can desaturate a specific zone by using your Adjustment brush. Activate the brush, move your Saturation slider to the left and begin brushing over the area with out-of-gamut color.

NOTE: As you adjust an image while soft-proofing, Lightroom will ask you after your first adjustment if you'd like to create a virtual copy of your soft proof. You can choose to Create Proof, or to Make This a Proof. Making the virtual copy creates a copy that's dedicated to the changes made for print output only (Figure 5a).

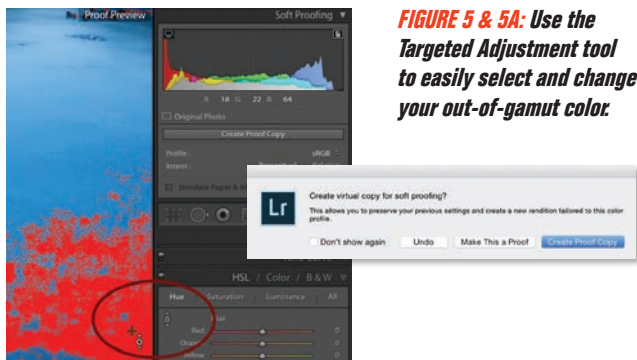


FIGURE 5 & 5A: Use the Targeted Adjustment tool to easily select and change your out-of-gamut color.

Step 3: Page Setup

After your soft proof, it's time to go to Lightroom's Print Module to begin configuring the settings for your print. In the lower-left corner of the Print Module, you'll find the Page Setup button, which launches the Page Setup dialog box when clicked (Figure 6). Your two goals for this step are simple: select the printer you're going to use and the paper size you're printing on, be it roll paper or a cut sheet.

Step 4: Print Settings

Just to the right of the Page Setup button is the Print Settings button, which launches the Print dialog box for you to configure. Again, setting locations may vary, but my goal is locating the Printer settings as shown in Figure 7. The objectives for Printer settings are to set the media type, turn color management off, make sure I'm printing with 16-bit output, and set the output resolution. Next, you'll want to find where you can set your Platen Gap.

Printer Settings: Here, the media type is set to Premium Luster Paper (260), but knowing the right setting for your media type likely will be a mystery to those printing for the first time. The easiest way to know is to go to your paper manufacturer's website, and find a data specification sheet or a "Read Me" file that provides their recommendation. You always can call the manufacturer if you find the information difficult to locate. Next, make sure you're printing with 16-bit output. Note that this setting is of no use if you're printing JPEGs, which are inherently 8-bit.

Color management should be turned off because we don't want the printer managing the color. The whole point of covering the use of ICC profiles in the last article was to gain control and consistency of our printing. So turn color management off, and in another workflow step, we'll point to the ICC printer profile. Lastly, I suggest using an output resolution of 2880 dpi. Most printers can be set higher, but it's not needed for photo prints and can greatly slow things down.

Platen Gap: While many photographers get away without worrying about the Platen Gap, it becomes important with two scenarios: if you get into using thick or heavy-weighted papers, or if you ever experience what's called a "head strike." A head strike is when your print head (the thing that spits the ink out onto the paper) makes contact with the paper as it moves back and forth along the paper. The results are usually ink splashes or streaks left on your print—usually on the edge of the paper. Head strikes happen, and the best way to fix the problem is by setting your Platen Gap accordingly.

The goal when configuring your Platen Gap is to have the print head as close to the paper as possible without touching or striking the paper. It's best to refer to your printer's manual for their recommendations on how to set the paper thickness. Options are usually to play with increasing your Paper Thickness settings, your Paper Suction settings (many printers have vacuums pulling the paper into the printer body to keep them flat as they run through the printer), Platen Gap settings and Roll Paper Back Tension settings (Figure 8).

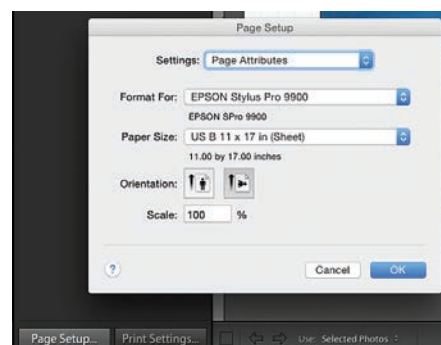


FIGURE 6: Click the Page Setup button to choose the printer and paper you're using.

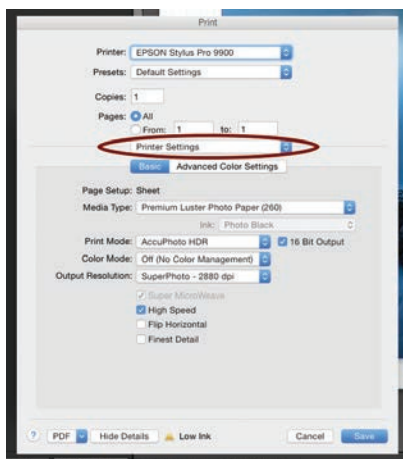


FIGURE 7: The Print dialog is where we configure settings such as the media type we're using, where we turn on 16-bit output and turn off color management, and where we set the print resolution.

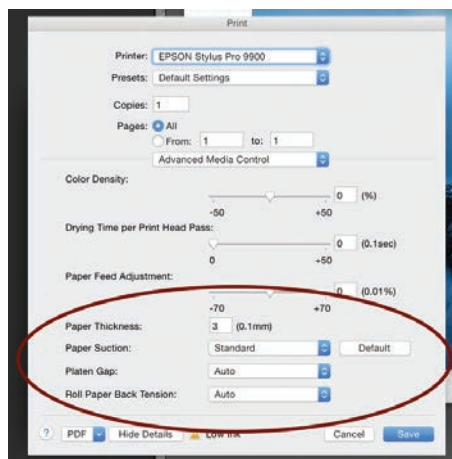
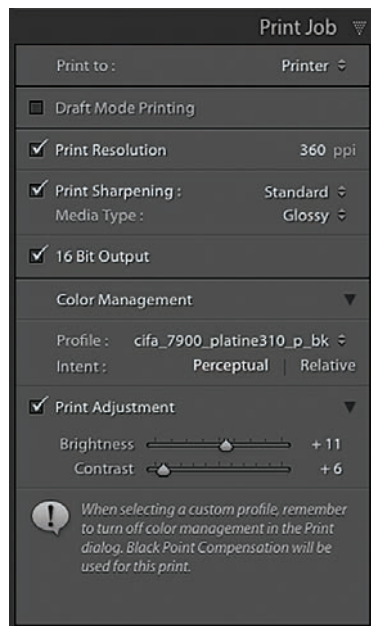


FIGURE 8: We also need to configure settings around the thickness and density of the paper we're using through these settings.

Step 5: Setting Your Printer Profile And Output Sharpening

Next, go to Lightroom's Print Job panel found in the lower right of the Print Module (Figure 9). Essentially, this panel controls the settings Lightroom uses to export a file before it goes to print. First, set the Print Resolution. I suggest setting Canon printers to 300, and to 360 for Epson; each of those will match the dpi capability of the Canon and Epson print heads. Next, set Print Sharpening, then 16 Bit Output, and then for Color Management, set the printer profile for your specific printer model and for the specific paper you're printing on.

FIGURE 9: In addition to configuring settings with the print driver as in the last couple of figure references, we also need to configure settings for how Lightroom exports our image in the Print Job panel.



Native Print Drivers Versus RIPs

The examples given here for configuring the printer settings are by way of using the Epson Print Driver. However, you may have heard of the option of using something called a RIP, or Raster Image Processor. In a nutshell, a RIP is a printer driver on steroids. In theory, it does everything better and faster than the native print driver, including giving you better overall print quality. There are many RIPs on the market, however, and not all are created equal or worth the buy. In fact, unless you're a professional printer, I would suggest not even looking into RIPs as an option. The gap between the qualities of the best RIPs versus using native print drivers has shrunk dramatically in recent years. Personally, I use an RIP called ImagePrint some of the time, but a lot of my printing is done straight through Lightroom and my printer's native print driver. The quality is great, and unless I need to gang-run many images at once, Lightroom printing handles things pretty well.

Workflow Summary

To borrow again from my previous article in this series, I suggest that you begin creating consistency and control of your printing by incorporating ICC color management into your routine. Calibrate your display, get your printer profiles from your paper manufacturer and install them. Then, once your image is developed to your liking, go through the following steps:

- Soft-proof your image to make sure all your colors are in gamut
- Make any corrections needed to bring out-of-gamut color in gamut
- Choose the paper size you're printing on, and the printer
- Print settings
- Printer settings
- Set your media type
- Set your output to 16-bit
- Turn off color management
- Set your resolution to 2880 dpi
- Set the Platen Gap
- Tell your printer the paper thickness you're using
- Set the amount of paper suction
- Set the roll paper back tension (not needed if printing on cut sheets)
- Set your printer profile and output sharpening

Digital printing is admittedly a technical endeavor. The days of printing creatively, with dodging and burning, with contrast masks and other techniques, are out the window with digital; all those creative steps are done in the Develop Module of Lightroom today. Once you've gone through these steps a few times, I promise you, printing digitally is easy. It will make you faster than ever, more consistent than ever and, ultimately, more productive than ever.

CHOOSING MATERIALS

A guide to selecting paper and alternative media options for photographic prints



ABOVE: *Printmaking is the most important step of a photographer's workflow.*

The first three articles in this series focused on the “why” and the “how to” of printmaking with modern tools. This fourth and final article will attempt to condense the “on what” we should print. I refer to the big decision of deciding what paper—or other medium—to use.

Surprisingly, choosing the medium is almost always an overlooked step, yet the right selection can help define a style for your work just as much as your choice of color versus black-and-white. It tells your audience that this paper is worthy of

all of the sweat, time and financial commitment you’ve put into your work.

Rarely does the serious photographer buy the most affordable camera and lenses because they’re good enough. Photographers want the best resolution and low-light capability, and the best glass they can afford because they want the most out of their gear. Well, the same goes for the printing medium. There are papers that are worthy and papers that are not.

In general, there are two main paths to go down. There’s the alternative media path, or what I often



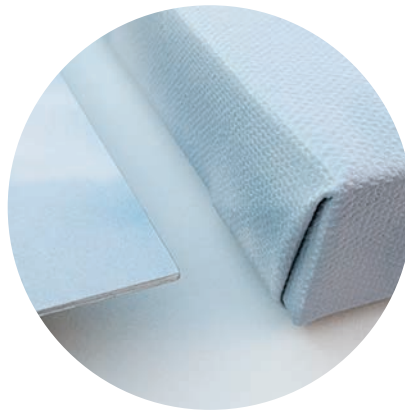
refer to as the wall-paneling path, and then there's the traditional fine-art paper path. The wall-paneling path is one that I consider a lower-cost, ready-to-hang alternative. It's a great way to either start seeing your art or collecting other artists' work without the requirement and expense of custom framing, and framing is an art unto itself.

Alternative Media And Wall Paneling

Digital printing has opened the door to printing on all kinds of media. We can print on canvas, acrylic, fabrics, parchment, onto film or aluminum sheets, and even directly onto wood. I hope you can gather from the list of options that digital printing often can be about the trend and obscurity of the medium rather than the accuracy, consistency and overall reproductive quality of the final product—not that there's anything wrong with that. Bearing this in mind, I think it's safe to point out that the two more popular mediums right now are canvas and printing on metal sheets.

Metal Prints. Printing on metal is done using a dye-sublimation process. The print isn't actually laid on the metal, but instead onto a transfer medium. The ink on the transfer medium is then moved to the metal by way of a heat press. Think of how an iron-on T-shirt is made. If you've ever sent one of your images to be printed onto a coffee mug, metal prints are made in the same manner. Metal prints are most often high-gloss, shiny, vibrant panels that work well for a presentation with punch, although there are also subtler, low-gloss metal presentations available.

Canvas. Unlike printing on metal, printing on canvas is typically done with the same aqueous inks you'll find in any Epson



ABOVE: Two of the most popular alternatives to printing on photographic papers are metal and canvas. Each can come ready to hang without the need for custom framing.

or Canon pro-grade printer. All canvases need to be coated to protect the print and to provide a more pleasing finish. Some labs do print on canvas with solvent ink printers, in which case coating isn't required because the inks are more durable and vibrant right out of the printer compared to aqueous inks.

Printing on canvas has become quite popular. I think this is mainly because canvas is a casual and engaging medium that's very lightweight and much more affordable than traditional paper and custom framing. Canvas tends to work well with large prints or mural-sized prints that are intended for distance viewing, and they work well in rooms that lack custom lighting. One of the complaints about canvas is that its inherent texture makes it a challenging medium for printing images with high detail.

Traditional Photo Paper

For me, nothing beats printing on paper, and I have a reverence for paper

that I don't have for other media. Paper provides a broader set of options for style, can offer better overall reproductive quality, and has a history and tradition that speak to the craft of photography, and to me, on a personal level.

The most beautiful prints I've ever seen, that have literally brought me to tears because they were so beautiful, were all on paper. There's a difference between being moved by an image and being moved by a print. If you're moved by the narrative and meaning of an image, then the medium may be incidental to your experience, but I've been moved by prints where the narrative meaning was almost incidental. What I became emotionally involved with was the print-maker's understanding of contrast, tonal relationships and the paper in such a masterful way that the print itself was the art. When you look at such prints, it feels like they're projecting light instead of reflecting it.

My personal bias aside, let's talk about paper substrates, and about a paper's look and feel, before we make such masterpieces.

Paper Substrates. Substrate is a term that refers to the materials that make up the paper. In general, photo paper is made from different kinds of wood pulp or cotton fiber. Yet, paper substrates are refined and coated in a myriad of ways. There are rag papers, alpha-cellulose papers, resin-coated papers, rice papers, baryta papers, bamboo papers and fiber papers. In any instance, the paper is made from either cotton or another plant-fibrous pulp such as alpha cellulose or bamboo.

Typically, cotton is king, as they say in the industry, but that's mainly because of brand recognition, as far as I can tell.



LEFT: Almost all of the papers on the market list their GSM (grams per square meter) specifications right on the front of the box, which refers to the paper's weight.



ABOVE: A Hahnemühle paper swatch shows us that papers are available in a variety of colors and textures.

Often referred to as rag papers, 100% cotton papers generally have the clout of being more “fine-art” than their substrate competitors. However, papers made from alpha cellulose are considered a lower-cost cotton alternative with little to no change in the quality or archivability of a paper.

An alternative for people who want trees in forests and not in galleries is bamboo paper. Bamboo isn’t widely used by paper manufacturers at this time, but we may see its market expand in the years ahead.

Paper Look and Feel. Regardless of one’s preference for substrate, there’s nothing more important than how a paper looks and feels. A paper can be made of 100% of the finest cotton fibers available, but if you don’t like how it looks, then who cares what it’s made of? A paper must be both visually and tactilely captivating to the photographer, and there are many contributing factors that make up the look and feel of a paper. Papers come in different weights, colors, reflectivity, textures and coatings.

The feel of a paper is dictated by both the weight of a paper and the paper’s texture. The weight is important because a paper needs to feel substantial in the hand of the photographer. If it’s too light and flimsy, it can feel inadequate; if it’s too heavy, it can seem like a card stock or rag board rather than a nice paper. The weight of a paper is almost always provided in GSM (grams per square meter). For example, a 220 GSM paper may be considered

lightweight, while 320 GSM may be considered a heavy paper.

Papers can be almost glasslike in their smoothness, or very rough, with a pitted and textured surface. This is important because some images work well on some textures, but poorly on others. Let’s say I have a portrait I want to print, and one of the highlights of the image is the feel of the soft skin tones. Printing that image on a rough-textured surface would kill that feeling.

The look of a paper is dictated mostly by its color and reflectivity. There are bright white papers, neutral papers and warm-toned papers. I have no opinion about one being necessarily better than the next. Like my previous example of avoiding putting a soft skin tone on a rough paper, some images will work better on a bright white paper, while others could use a little warmth. For my work, I tend to like my black-and-white images on neutral-toned

paper and my color work on a warmer paper. I don’t print on bright white papers much, although I have many architectural and product photos that work very well with these papers, as it helps provide a crisp and clean feel.

What may be the most important factor to photographers is a paper’s reflectivity. There are glossy, matte and semigloss papers. Glossy papers are highly reflective and designed for high impact. They produce deep, vibrant colors with high contrast and lots of detail, and are ideal for bold prints. Glossy papers are a good choice for color landscape and wildlife photography, commercial photography or anything that has a lot of color, contrast or impact. On the downside, many glossy papers are fragile, can pick up fingerprints and can scratch easily, and the highly reflective nature of glossy papers actually may distract a viewer from an image. Glossy papers require proper lighting to minimize

Pairing Paper To Photographic Style

Here are a few suggestions for pairing papers to specific styles of photography. I recommend using it as a guide to start trying different kinds of papers to discover what paper matches your style best.

	<i>Cotton Rag Paper</i>	<i>Fiber Paper</i>	<i>Luster Paper</i>	<i>Matte Paper</i>	<i>Metallic Paper</i>	<i>Canvas</i>	<i>Glossy Metal</i>	<i>Baryta Paper</i>	<i>Glossy Paper</i>
<i>High-contrast B&W</i>		•	•		•	•	•	•	•
<i>Low-contrast B&W</i>	•	•	•	•				•	
<i>Vibrant color</i>		•	•		•	•	•	•	•
<i>Soft pastels</i>	•	•	•					•	
<i>HDR images</i>		•	•		•	•	•	•	•
<i>High-key imagery</i>	•	•	•	•				•	
<i>Low-key imagery</i>	•	•	•	•				•	
<i>Smooth textures</i>	•	•	•	•	•			•	
<i>Rough textures</i>		•	•			•		•	
<i>Portraiture</i>		•	•					•	
<i>Large-print murals</i>	•	•	•	•	•	•	•	•	•
<i>Gallery & exhibition prints</i>	•	•		•				•	

reflection, and if properly lit, they can be quite beautiful, but if they're hung on a wall without care, they end up being more like mirrors than prints.

Alternatively, matte papers have little to no reflectivity, ideal for mounting in rooms with less-than-perfect lighting situations. They provide less impact with color and contrast, but offer a finer medium for photographers who prefer quieter tones. Matte papers are ideal for more fine-art work as opposed to commercial work, and are widely used by lovers of black-and-white photography. They're also fragile and can pick up oils from your hands easily, so cotton gloves are highly recommended when handling.

Lastly, semigloss papers are the most common and versatile of all the papers. Semigloss papers can be used with high-impact images or images with smoother tonal features. Semigloss papers are generally the most durable of the three categories, though I'm a believer in handling prints with cotton gloves regardless. Semigloss papers can work under good or imperfect lighting conditions and are available in a wide range of variations. Semigloss papers

come as baryta papers (baryta refers to the addition of the compound barium sulfate), luster papers, fiber papers or pearl papers.

Where to Begin

Regardless of whether you choose a traditional paper print or alternative media, I suggest taking your time playing with the options out there to learn what's going to suit your work and your style best. There are no hard-and-fast rules to this stuff.

Additionally, most labs can make small samples for you on different papers without you having to invest too much—I offer this to my clients. If you print at home, many paper manufacturers will offer sample packs of their paper lines so you can try a variety of papers at once. All I ask is that you look at good, high-end, fine-art papers, and shy away from the generic brands. The good news is that there are many excellent sources for premium papers today. I think Moab, Epson, Innova, Ilford, Red River, Canson and Hahnemühle, just to name a few, all have exceptional papers to sell. For my work, I tend to use Hahnemühle and Canson

almost exclusively, as I think they make sublime papers, and each company has a rich history with many contributions to the world of art papers—they have been around for literally hundreds of years.

Regardless of where you settle, print something, and print a lot. Digital photography has pushed the way we interact with our work into the realm of the virtual—the print remains as the one way that we get to hold, feel, see and interact tangibly with our art. Painters, sculptors, musicians, dancers, potters, chefs and actors are all artists who produce art that engages our senses in one way or another in a physical space. The photographer's job is the print.

Jason Bradley is a nature and underwater photographer from Monterey, California. He owns and operates Bradley Photographic Print Services and Bradley Photographic Workshops, and is the author of "Creative Workflow in Lightroom" by Focal Press. To see more of Bradley's work, visit BradleyPhotographic.com.



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