

# Lightroom: Camera to Print

## Part 3 - Printing

October 2021  
Dennis Fritsche

# Part 3A

“The negative is the score, and  
the print the performance.”

- *Ansel Adams*

# Ansel - Single Sheet Film and Wet Dark Room

## **The Score**

- Optimally expose and develop film to produce the *Negative*
  - Preserve shadow detail with exposure
  - Recover highlights with development through choice of chemicals, development times, etc.
- Once developed, the negative does not change

## **The Performance**

- *Print* to achieve the photographer's vision
  - Low or high contrast papers and chemicals
  - Low or high key
  - Dodging and burning for local tone control
  - Paper choice - textured/smooth, cool/warm, gloss/matte
  - Finish with chemicals to tone the print – sepia, cyno-type, duo-tone

“The RAW file is the score, the  
processed digital file is the dress  
rehearsal, the print is the  
performance”

- *Dennis Fritsche*

# Today – Digital capture, digital processing, output to file or print

## **The Score**

- Optimally expose the sensor to product the RAW file
  - Preserve highlight detail with exposure
- Once captured, the RAW file does not change

## **The Dress Rehearsal**

- Process the RAW file to achieve the photographer's vision
  - Low or high contrast
  - Low or high key
  - Dodging and burning for local tone control
  - Digitally tone the print – sepia, cyno-type, duo-tone
- The processed file can be changed or improvements or different interpretations

## **The Performance**

- *Print* to finalize the photographer's vision
  - Media choice - textured/smooth, cool/warm, gloss/matte, metal/paper, etc



# Auditions – Print Early/Print Often



Print 1  
Epson Legacy Fibre  
Relatively low contrast

Print 2  
Canson Baryta Prestige  
Local controls to increase  
Contrast and Sculpt the  
image

Print 3  
Epson Legacy Etching  
Reduce harshness in  
textured granite

Print 4  
RR Palo Duro Etching  
Change crop



# Topics

- Why Print Photographs
- Color Management and the Display and Work Environment
- Options for Printing Your Photograph
- Paper choices
- Soft Proofing and Hard Proofing
- Printing from Lightroom to Your Printer
- Printing from Lightroom to a File and Ordering a Print
- Experience Ordering Prints
- Resources



# Why Print Photographs?

- A print is the ultimate manifestation of the photographer's art.
- The tactile feeling of holding a print on fine paper is gratifying.
- When a photograph is hung on the wall, it is enjoyed each time someone passes.
- You will learn to be a better photographer.
- A photograph can last 100's of years but your digital files will be forgotten tomorrow.

# Obsession or Addiction?









# Color Management and the Display and Work Environment



# My Print is Too Dark and Does Not Match the Monitor

- They will never be exactly the same
  - Monitor emits light and a print reflects light
  - The monitor can show more colors than the printer
  - Different printers and papers show colors differently
- But you can get close
  - Monitor calibration
  - Work and Viewing Environments

# Color Management and Viewing Environment

- You must have good color management habits to achieve repeatable results
  - Calibrate your monitor!
  - Set the brightness to 120 cd/m<sup>2</sup> for a relatively bright room. I use 75 cd/m<sup>2</sup> for a fairly dark room.
  - Use a white surround when editing.
- Let Lightroom or Photoshop control the color
  - Download the correct paper/printer profile from the paper manufacturer.
  - Follow the instructions in setting the paper type!
- A Note on Colorimeters
  - If you have an older instrument, read this <https://photographylife.com/the-basics-of-monitor-calibration#colorimeters>



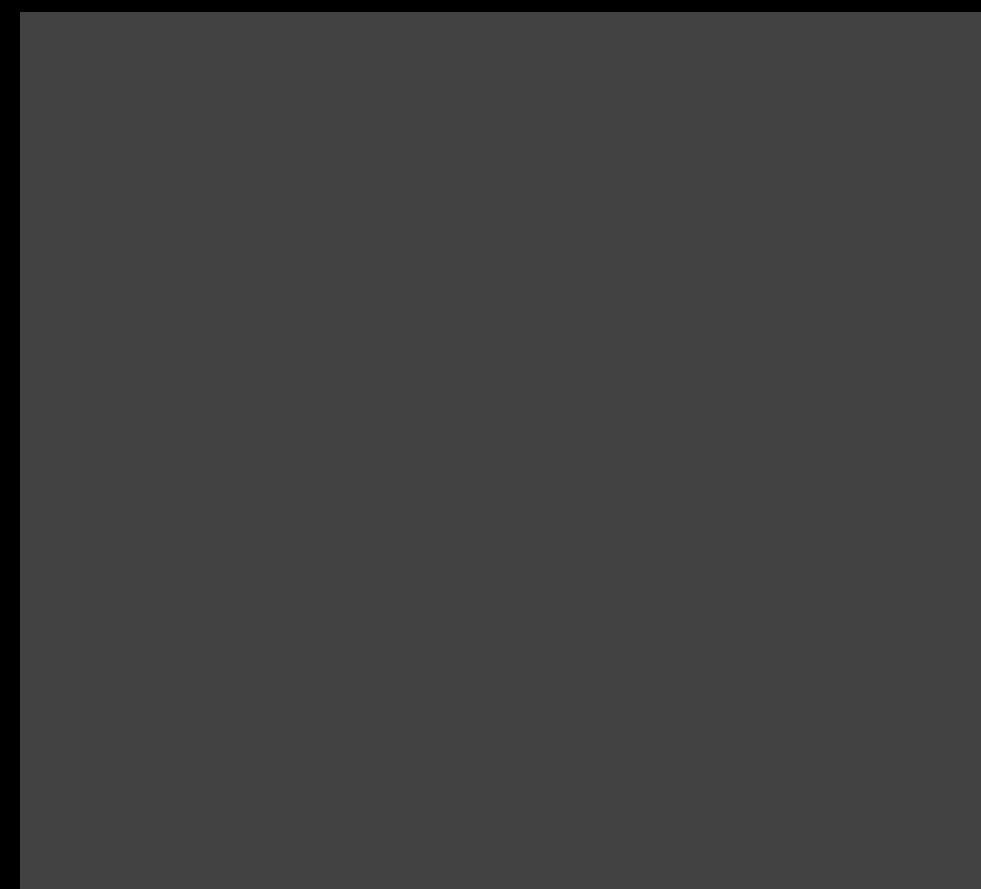












# Color Spaces

- Color spaces (also referred to color profiles or gamut) can be either:
  - Device-independent (e.g. Adobe RGB)
  - Device-dependent (e.g. Epson P900, UltraChrome HD PRO10 ink on RR UltraPro Satin paper)
- Some common device-independent RGB color spaces are:
  - sRGB IEC61966-2.1 - created by HP and Microsoft for images to be displayed on “typical” monitor. Smallest gamut. Only supports 8 bits.
  - Adobe RGB 1998 - developed by Adobe as an alternative to sRGB to provide a better gamut match for printers. Is a good general-use color space for images that can be output on a variety of devices. It encompasses roughly 50% of the visible colors of light.
  - ProPhoto RGB is a popular wide-gamut color space that includes much larger gamut than today’s printers allowing for growth. Default for Lightroom.
- Device-dependent color spaces describe specific device behavior. They include color spaces for cameras, scanners, monitors, printers/papers...

# Printer Color

For printing, the colors in your image have to be converted to account for the printer, settings, ink and paper. This can be done a couple of ways:



Have your software (e.g. Lightroom, Photoshop) manage the color conversion using paper/ink (icc) profile.

Have your print driver perform the color conversion using a printer embedded profile.

Be sure that both the printer and processing software are not both trying to manage the color.





# Device Dependent Manufacturer Supplied Paper Profiles

● **RED RIVER PAPER**  
Inkjet Paper by Inkjet Experts

Since 1997

Google Custom Search

**Snapshot Sale**  
4x6 5x7 Up to 40% Off

[Shop for Papers](#) [Top Selling Papers](#) [Inkjet Greeting Cards](#) [Sample Kits](#) [Ink Cartridges](#) [Accessories](#) [Support](#)

You are here: [InfoCenter](#) » **Inkjet Printer Color Profiles**

Welcome to Red River Paper's inkjet printer profile library - the largest private collection of ICC color printer profiles on the web. Here you will find printer profiles for your printer and many different Red River papers as well as help understanding how to install and use printer profiles.

**Rapid Profile Locator**

Choose your printer make then model to quickly find the right profiles.

●

● **Profile Support Center**

While using printer profiles is not at all complicated, you will need to follow a specific set of instructions to get properly color managed prints.

[How to Install Profiles](#) [Color Profile FAQ](#)

[How to Use Profiles](#) [Seven Tips for Using Printer Color Profiles](#)

**Canon Profiles**

Download printer specific  
paper profiles from the  
paper manufactures website

● **Canon Pro Printers**

- PRO-1000
- PRO-10
- PRO-1
- PRO-100

rr-ups4-can-pro-100

rr-ups4-can-pro-100

Organize Extract all files

Name	Type	Compressed size	Password p...	Size
profile-instructions-all-canon-pro-100	Adobe Acrobat Document	59 KB	No	
RR UPSatin 4.0 CanPro-100	ICC Profile	801 KB	No	

# Device Dependent Manufacturer Supplied Paper Profiles



Color profiles are data files that contain a description of how a particular paper, ink, and printer create all colors, shades, and densities. Using a profile will result in more accurate and consistent output.

**Printer:** Canon Pro-100

## Setting Recommendations

Manual Color Adjustment Matching: None

Print Quality: Custom / Set Level 2

## Support

How to install profiles

[www.redriverpaper.com/installprofiles](http://www.redriverpaper.com/installprofiles)

How to use profiles

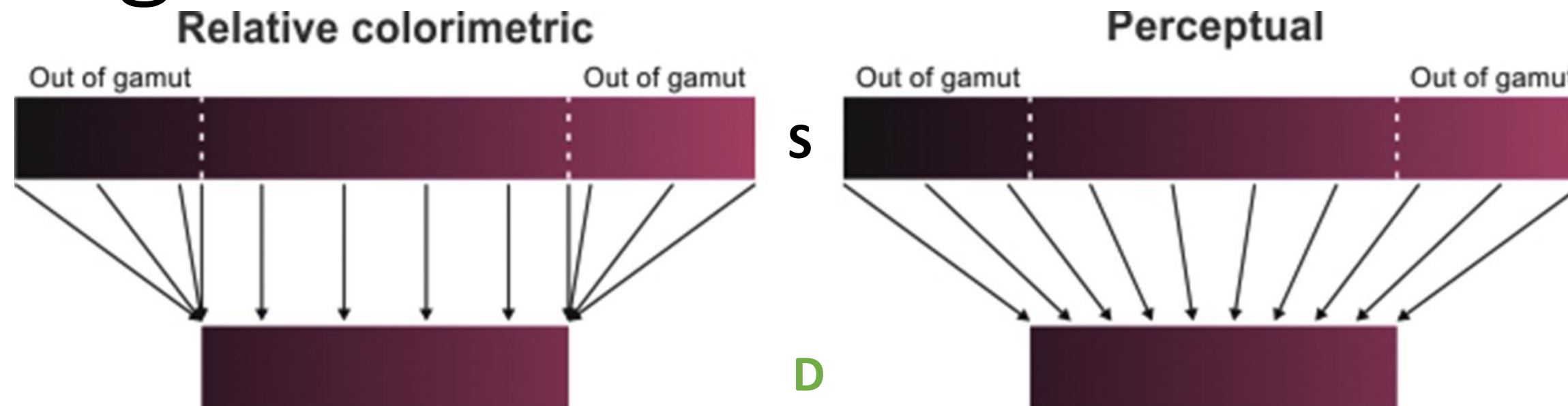
[www.redriverpaper.com/useprofiles](http://www.redriverpaper.com/useprofiles)

Instructions providing  
printer settings are usually  
packaged with the paper  
and provided with profile.  
Also available online.

## MEDIA SETTING RECOMMENDATIONS

Paper	Media Setting	Special
68lb. UltraPro Gloss 2.0	Photo Paper Plus Glossy II	
66lb. Arctic Polar Gloss	Photo Paper Plus Glossy II	
60lb. & 42lb. Pecos River Gloss	Photo Paper Plus Glossy II	
96lb. Pecos River Gloss Magna	Photo Paper Plus Glossy II	<a href="#">Prevent Paper Abrasion</a> Use single sheet feed
86lb. Pecos River Gloss Duo	Photo Paper Plus Glossy II	<a href="#">Prevent Paper Abrasion</a> Use single sheet feed
45lb. Zeppelin SemiGloss	Matte Photo Paper	
68lb. UltraPro Satin 4.0	Photo Paper Plus Semi-Gloss	

# Rendering Intent



- Relative Colorimetric and Perceptual are the two rendering intents used for photography. They define how to map out-of-gamut colors from one color space to another.
- Relative colorimetric – Colors outside the destination gamut are mapped to the nearest reproducible color. Colors within the destination gamut are not altered. Photoshop defaults to relative colorimetric.
- Perceptual – full source space is compressed to fit into the destination space while maintaining the relationship between colors. Lightroom defaults to perceptual.
- Most of the time it does not matter. Relative colorimetric works well when most of source gamut is covered by destination gamut. If your image has a lot of very saturated colors, perceptual may be a better choice. If in doubt, try them both and choose one that looks best. Can get an idea using soft proofing.

# Options for Printing Your Photograph



# Options for Printing Your Photograph

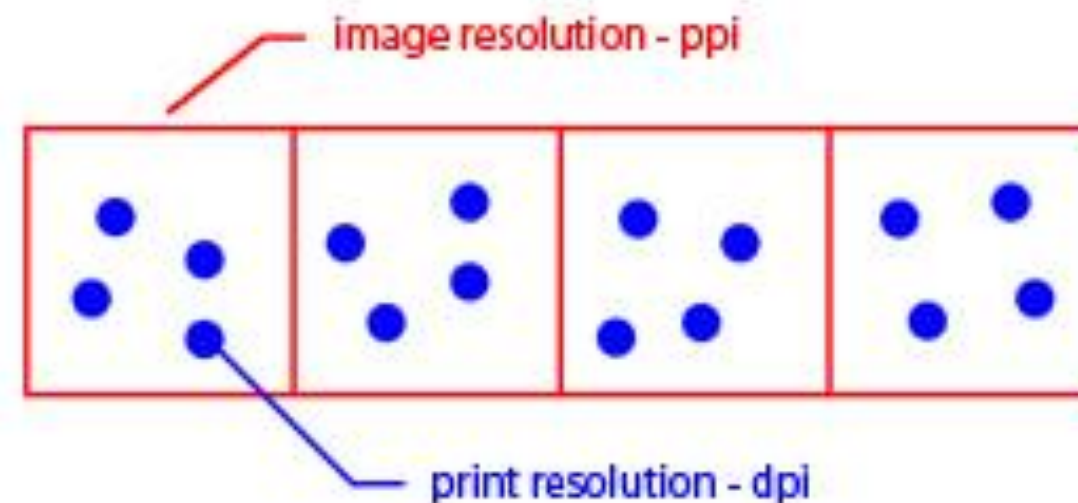
- Ink Jet Printer
  - **Epson**, Canon, HP
  - 13 inch, 17 inch, 24 inch, 44 inch
  - 8 to 12 inks
  - I use the 17 inch Epson P900
- Printing Service
  - You sign-up for the service, send files to them, and pick-up your print
  - Other services often available such as mounting, books, etc
  - Please note the following for PPC Contests *“While images may be printed by the entrant or a photo lab/print service, the latter should not be allowed to alter the image itself (e.g., through color correction, white balance, or cropping).”*

# Inkjet Inks

- Inks have major impact on
  - Color gamut and B&W quality
  - Print life and stability
- Basic ink types
  - Dye
    - Vivid color
    - Shorter life, but have gotten much better
  - Pigment
    - Deeper blacks
    - Longer life - archival
- All prosumer inkjet printers use RGB inputs and convert in printer to CMYK inks
- Color gamut depends on ink, profile and paper
  - CMY are basic ink colors used in all printing
  - K added for crisp, neutral blacks
  - LC and LM often added to provide better shading
  - Other colors may also be added to extend gamut – red, orange, blue, green
- Better black and white – smooth tonal gradients and deep blacks
  - Shades of gray added to get smooth tonal gradients – often K plus 2 grays
  - Use photo and matte black ink for deeper blacks on different papers

# Inkjet Printing Resolution

- Inkjet printer input is image pixels and the printer algorithms translate these pixels into droplets of ink.
- Resolution is important when printing an image. Actually, two resolutions.
  - Image resolution - the number of pixels that you want to print per inch (ppi).
  - Printer resolution or quality setting - the number of droplets (dots) of ink that are used to represent each pixel expressed in dots per inch (dpi).



- When printing an image,
  - Image processing software sends pixels to the printer.
  - Printer takes care of putting ink down on paper.
  - Think in terms of image resolution (ppi) when sizing image.
  - Printer setup quality choice determines the printer resolution (dpi).

# Image to Printer Resolution

## (Inkjet Printing)

- *Image resolution* of the printed image will determine how much detail will be rendered.
  - The image resolution is set by viewing distance.
  - When viewing an image up-close, an image resolution of 200 to 300 ppi provides good results.
- *Printer resolution* determines how much ink is laid down.  
The higher the printer resolution
  - The more droplets per pixel.
  - The more ink used.
  - The slower the printer.
  - The better the print looks.

# Printer Resolution

## (Inkjet Printing)

- *Printer resolution or quality setting* defines the number of droplets of ink that the printer lays down, ie dots per inch (dpi).
  - Epson native resolution is 720 ppi. Typical printer resolutions are 720, 1440, 2880, 5760 dpi... (Draft, Photo, Best Photo... )
  - Canon native resolution is 600 ppi. Typical printer resolutions are 600, 1200, 2400, 4800 dpi... (Fast, Standard, High...)
- Regardless of the image resolution (ppi) sent to the printer, the printer will render the image at a multiple of it's native resolution.
- Printer algorithms determine how printer translates image resolution (ppi) into the pattern of ink droplets based on printer resolution (dpi)
- So, where to set the final image resolution for printing.
  - Printer driver's interpolation algorithms are getting much better
  - But, image processing software is probably better
  - Consider sending image to printer at multiple of its native resolution
  - Recommended image resolution - 300 ppi for Canon and 360 ppi for Epson

# Photo Labs

- Be sure your image is prepared to match lab process – file type, color profile, resolution and aspect ratio.
- Most consumer labs expect jpeg files with embedded sRGB color profile.
- Limit lab adjustments for predictable results.
- 200-300 dpi input resolution preferred. Appears most labs will accept very low res files.
- Many labs will crop (blowup) image to fill standard formats.
- Will probably want to do test series to dial in image.
- Club members are using Costco, Bay Photo, BWC, Shutterfly and Full Color.



# Paper Choices

# Paper Choices

- The choice of papers has a big impact on the quality of the image and how the viewer reacts.
- I like paper almost as much as I like lenses. And they both matter when trying to get the last bit of nuance in your photograph.
- Rag or Fiber Matte has the best overall combination of feel, texture, detail, color space, and pop for me at the moment.
- A high-quality gloss or luster will give somewhat deeper blacks and more saturated colors but can have reflection and surface texture characteristics that can distract a bit (but not usually an issue when framed).
- Optical Brighteners (OAB's) can give paper a pop but can be an issue over the very long run. Not a real problem for us mortals.

# Some Paper Descriptions

- Canson Infinity Plantine Fibre Rag –low-gloss lightly-textured satin, cotton rag, near white, acid free, no OBAs, 310 gsm, 15.6 mils, discontinued Epson Legacy Plantine is similar
- Harman Matte Cotton Smooth –smooth matte finish, cotton rag, acid free, 300 gsm, 22 mils, discontinued
- Hahnemuhle Harman Gloss Baryta – near smooth glossy, near white, alpha cellulose, acid free, 320 gsm, 12.5 mils, discontinued Hahnemuhle Photo Gloss Baryta is similar
- Hahnemuhle Harman Gloss Baryta Warmtone – same as above with warm color
- Epson Legacy Fibre – smooth matte fine art, cotton fiber, near white, no OBAs, 310 gsm, 19 mils
- Epson Cold Press Bright – textured cold press fine art, near white, acid free, cotton base, no OBAs, 340 gsm, 21 mils
- Red River UltraPro Satin – medium depth satin, bright white, acid free base with slightly acid coating, 270gsm, 10.4 mils
- Red River Palo Duro SoftGloss Rag – slightly-shiny lightly-textured satin, near white, cotton rag, acid free, no OBAs, 310 gsm, 16.5 mils
- Red River Palo Duro Etching – cold press fine art, deep texture, warm white, cotton rag, acid free, no OBAs, 315 gsm, 21 mils
- Red River Aurora Art White – hot press semi-smooth fine art, white, cotton rag, acid free, minimal OBAs, 250 gsm, 13.5 mils, double sided

# What do some of these code words mean?

- Baryta - A baryta paper has barium sulfate coatings which provides a white, smooth satin finish.
- Cold Press – goes back to handmade paper, where wet pulp was spread over screen or fabric to dry which produced a textured surface.
- Hot Press – similar to cold press except pulp is placed between smooth (heated) plates or rollers to dry resulting in a smooth surface
- Fibre – paper substrate may use cotton fiber or alpha cellulose fibers
- Rag – subset of fibre with paper substrate using cotton fiber
- Resin-coated (RC) – plastic substrate or fiber base substrate impregnated or sealed with plastic
- Bright or White – cool toned to neutral white paper color
- Warmtone – warm creamy or yellowish paper color
- E-surface – darkroom designation for luster paper
- F-surface – darkroom designation for glossy paper



# My Current Favorites

- Matte
  - **Epson Legacy Fibre Rag – smooth texture**
  - **Red River Palo Duro Etching – heavy texture**
  - Epson Hot Press Bright
  - Canson Infinity Fine Art Rag Photographique
- Gloss
  - **Canson Infinity Fine Art Baryta Photographique II**
  - **Canson Infinity Fine Baryta Prestige**
  - Hahnemuhle Photo Gloss Baryta (has some curl)
  - Hahnemuhle Baryta FB

# High Quality Paper at Lower Cost

- Red River is a Dallas based supplier of high quality paper at a low cost
- <https://www.redrivercatalog.com/>
- Generally not sold through retailers. Available locally at
  - Red River Corporate Office
    - Will mail
    - Pickup - (SW quadrant of Stemmons and Mockingbird) 8330 Directors Row. Dallas Texas, 75247
  - Competitive Camera - 2025 Irving Blvd Suite 107, Dallas, TX 75207
- Some Red River papers used by club photographers
  - Red River UltraPro Satin PK
  - Red River Palo Duro SoftGloss Rag PK
  - Red River Aurora Art White (Hot Press) MK
  - Red River Palo Duro Etching MK
  - Red River Polar Matte MK

# Soft vs Hard Proofing

# Soft Proofing and Hard Proofing

- Soft proofing is done in LR or PS and shows you what your print is likely to look like.
- Hard proofing is printing the photograph and seeing what it actually looks like.
  - Print early and print often.
  - Create a consistent viewing environment.
  - Spend some time with the first prints to get to know them.
  - Having more than one print out can help identify tint problems.



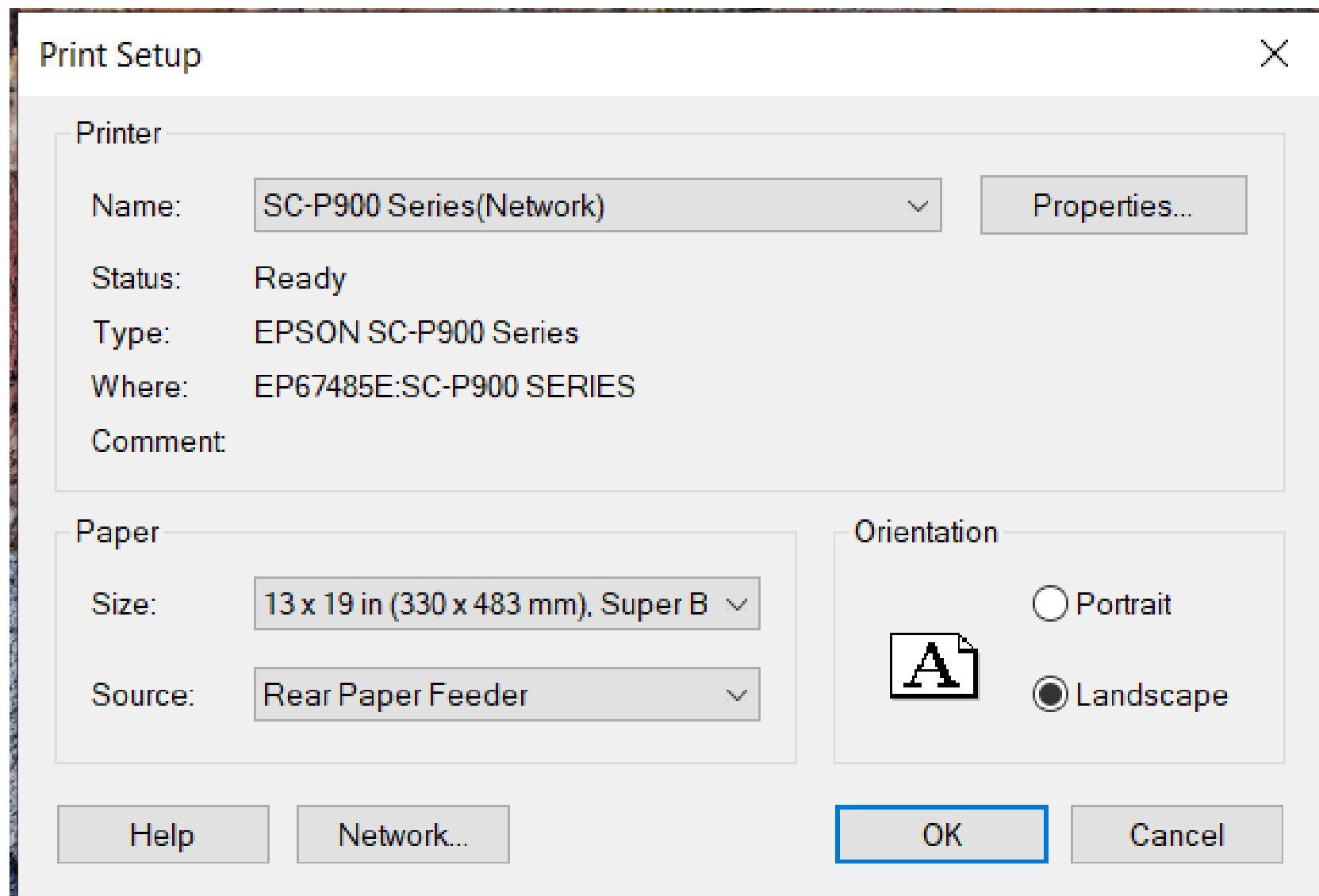
# Part 3B

# Demonstration

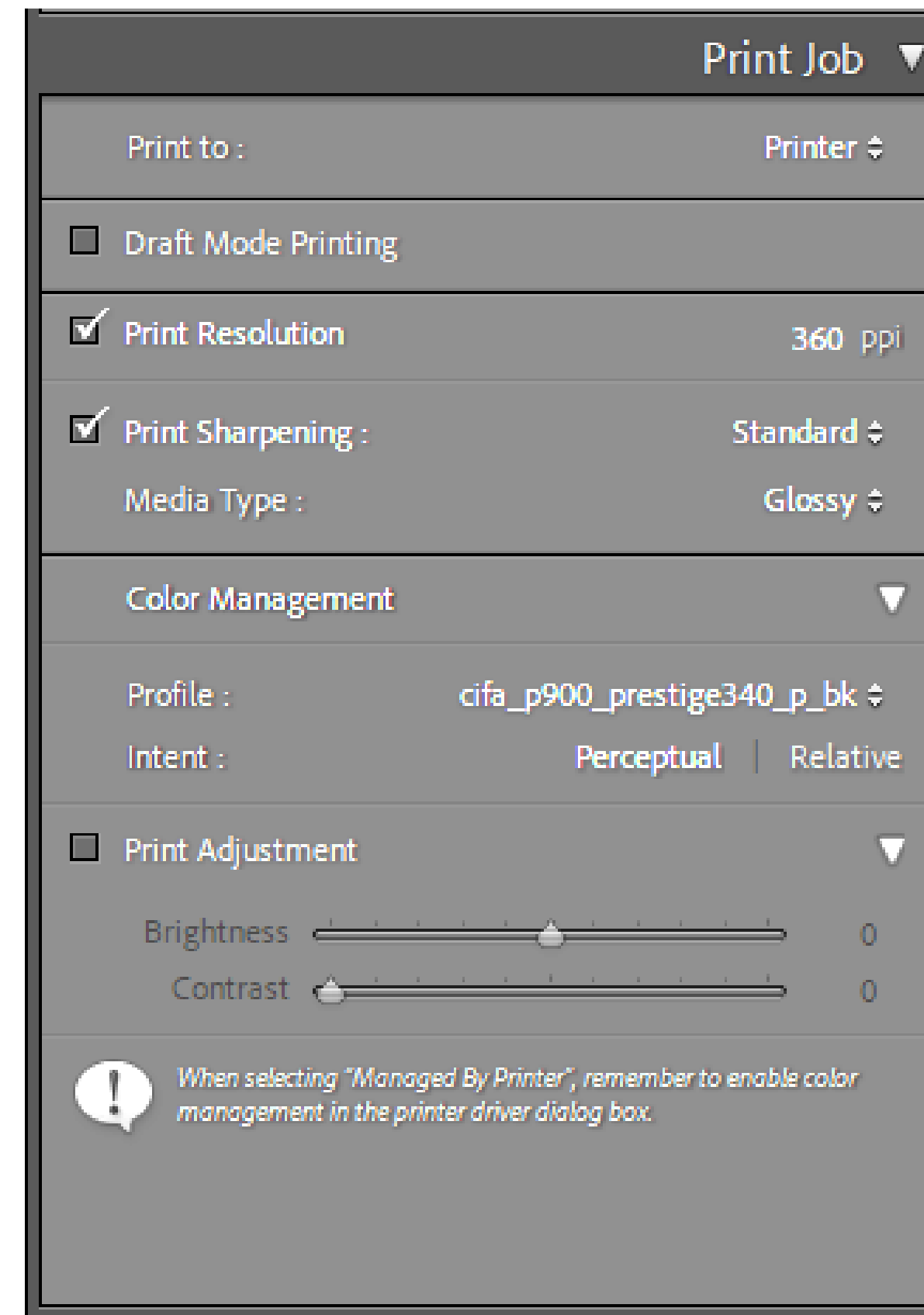
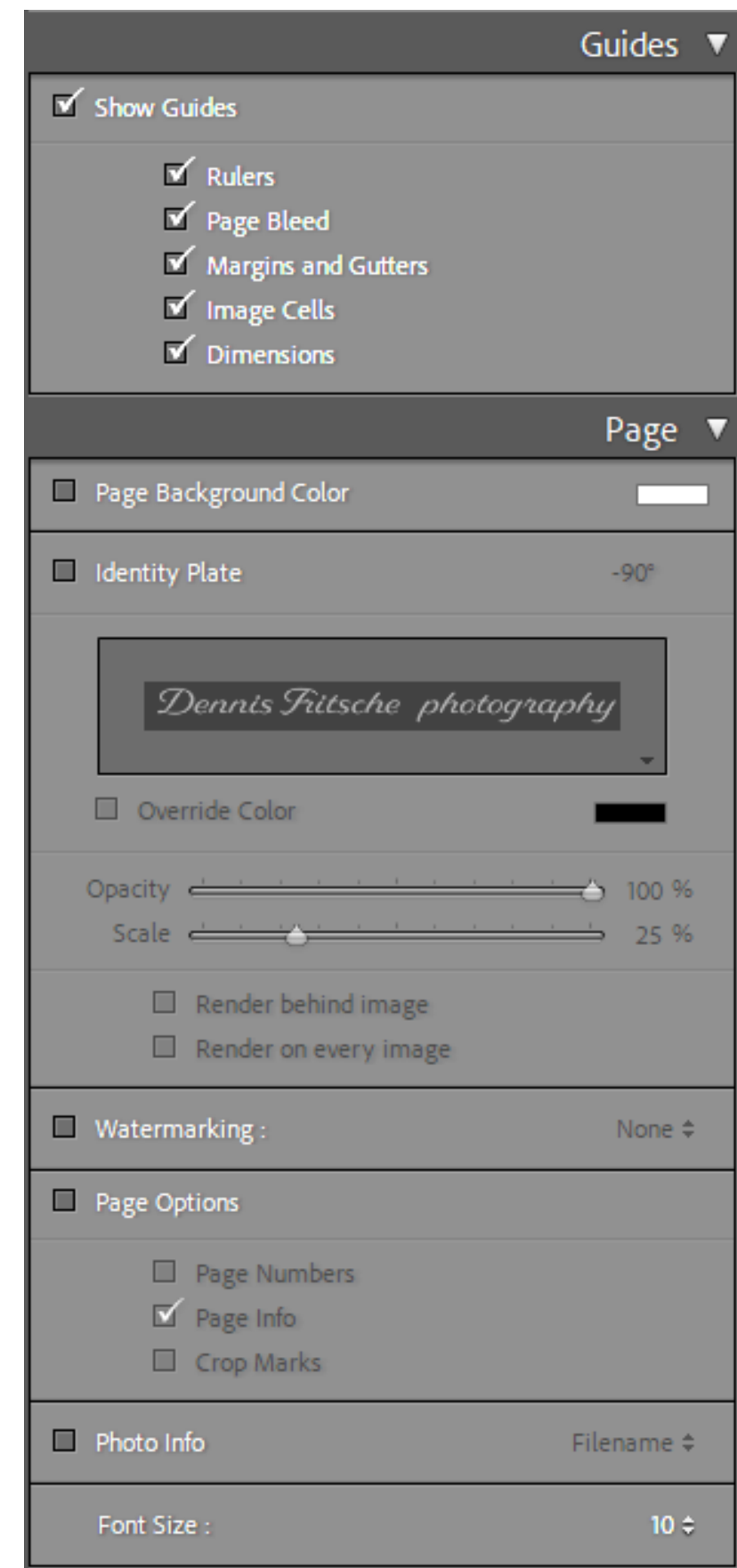
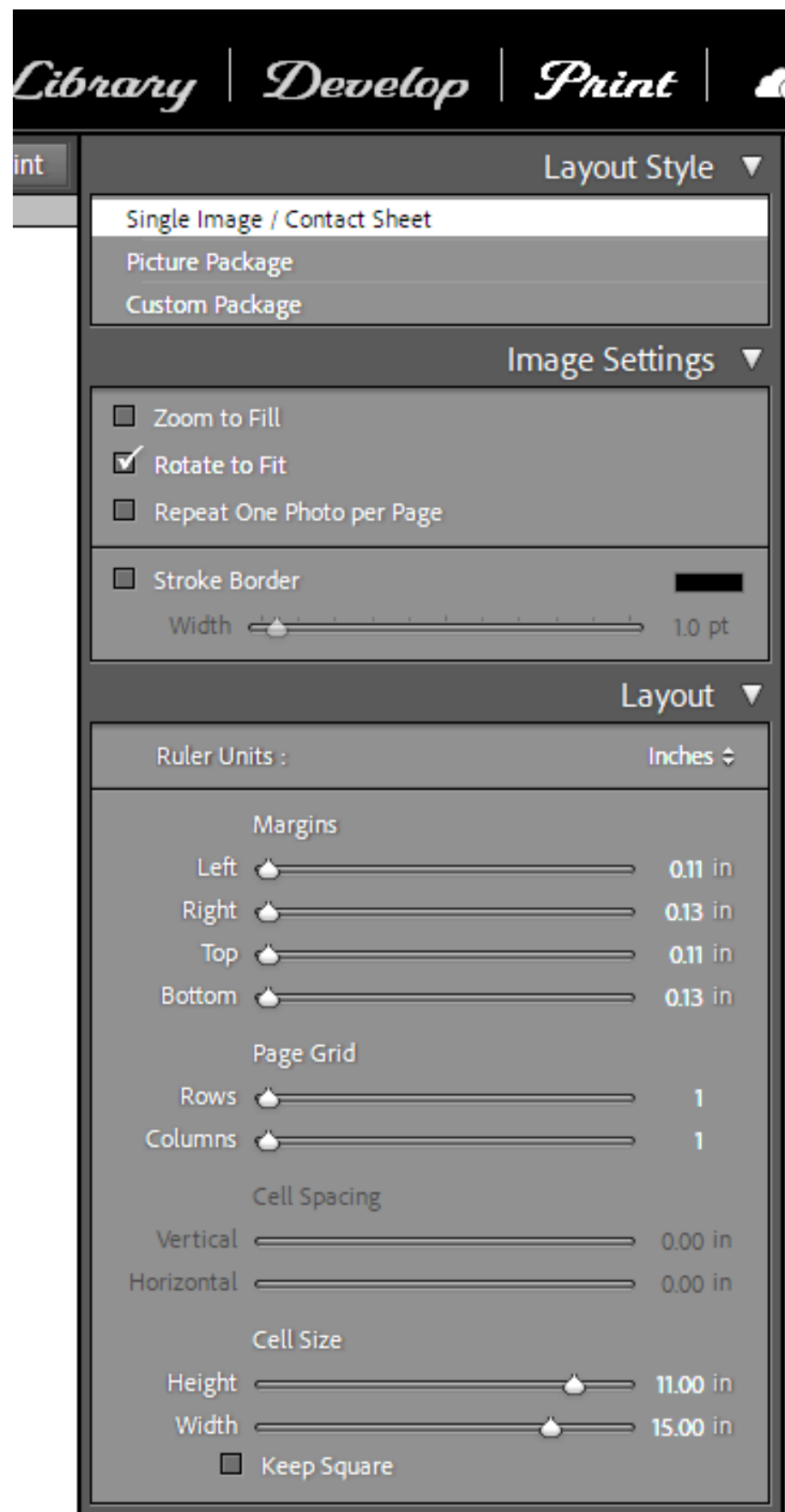
Printing from LR to your local printer.

Color

# Printer Set Up and Properties for Epson - Color



# Lightroom Setup for Color



# Demonstration

Printing from LR to your local printer.

Black and White



# Two Ways to Print B&W

## Print Using Special B&W Modes

- Special printer B&W mode should create neutral prints
  - Usually available in printers with 3 black inks
  - Forces black inks to be used. Smooths tonal variations and increases permanency.
  - May use color inks to create neutral black depending on paper
  - Monochrome images may be toned with a single color using color inks.
- If your printer has a B&W mode, try using it
  - Choose paper type, quality setting and appropriate ink.
    - For third party papers, try using settings the manufacturer provides with the color profile.
  - Choose B&W printing mode
  - Go to color controls to adjust tonality, tint, contrast and brightness
  - Choose either image processing software or printer to control color.

# Ways to Print B&W

## Print as a Color Image

- Convert image to B&W in post
- If your printer does not have B&W mode, print as you would any color image.
- Use ICC color profile based management
  - Printer tries to print neutral image
  - Most color profiles are not optimized for neutral gray
  - May have color cast that may need to be removed
  - Color cast may be paper dependant

# B&W Print Color Casts



Blue Tint 7% Sat

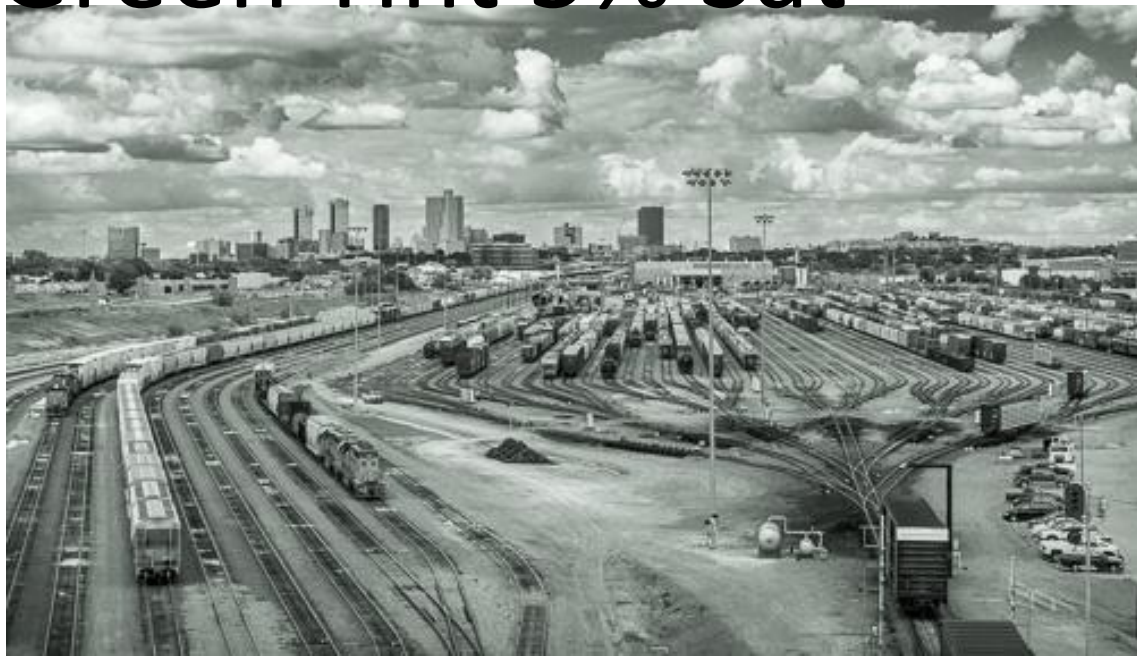


Yellow Tint 7% Sat

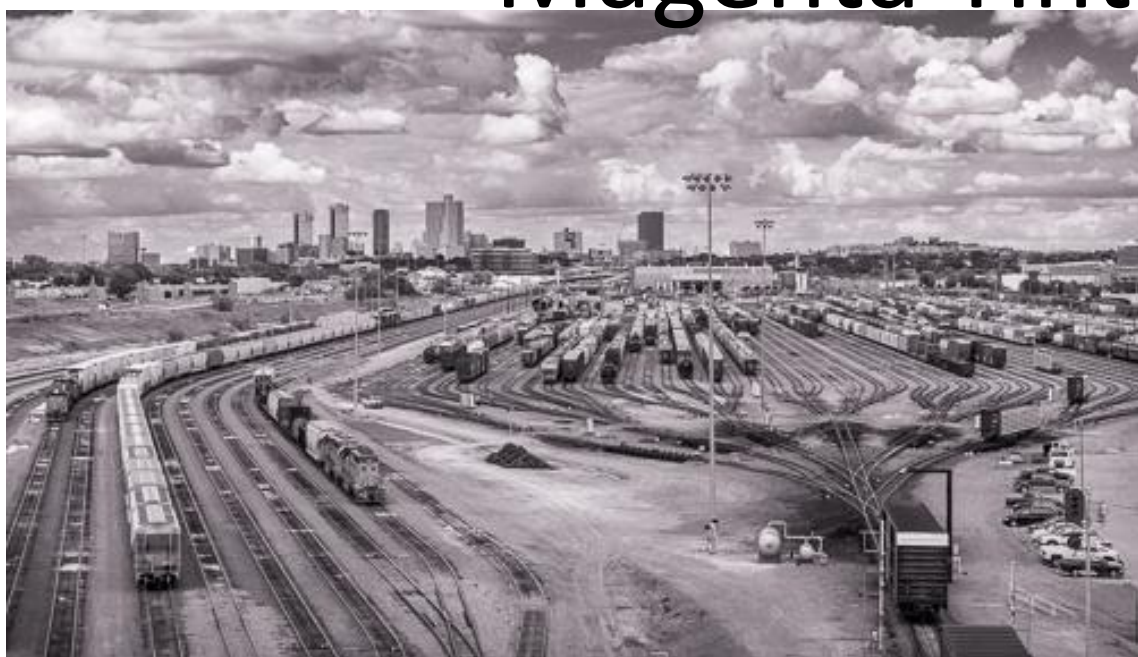


Neutral

Green Tint 5% Sat

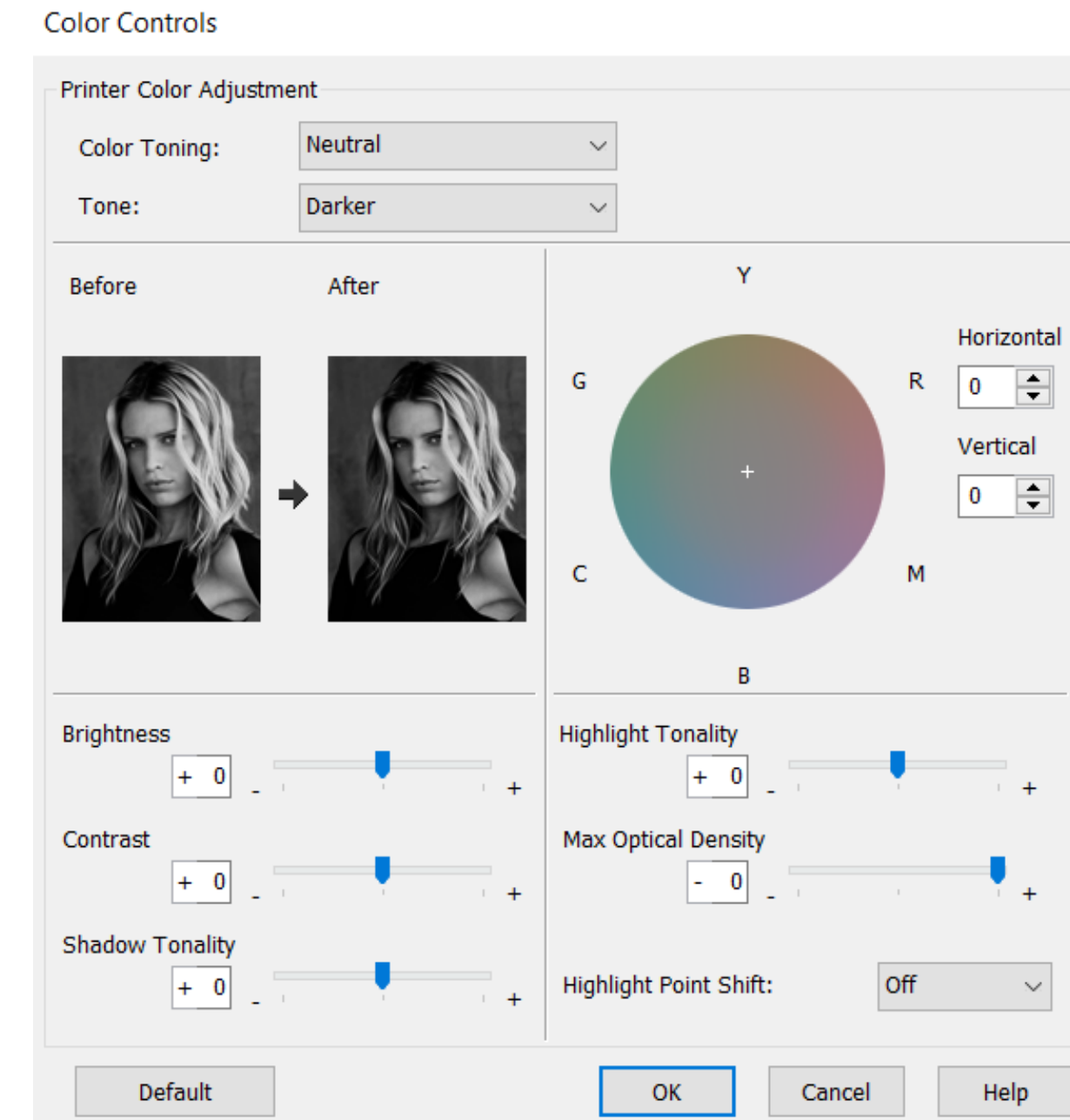
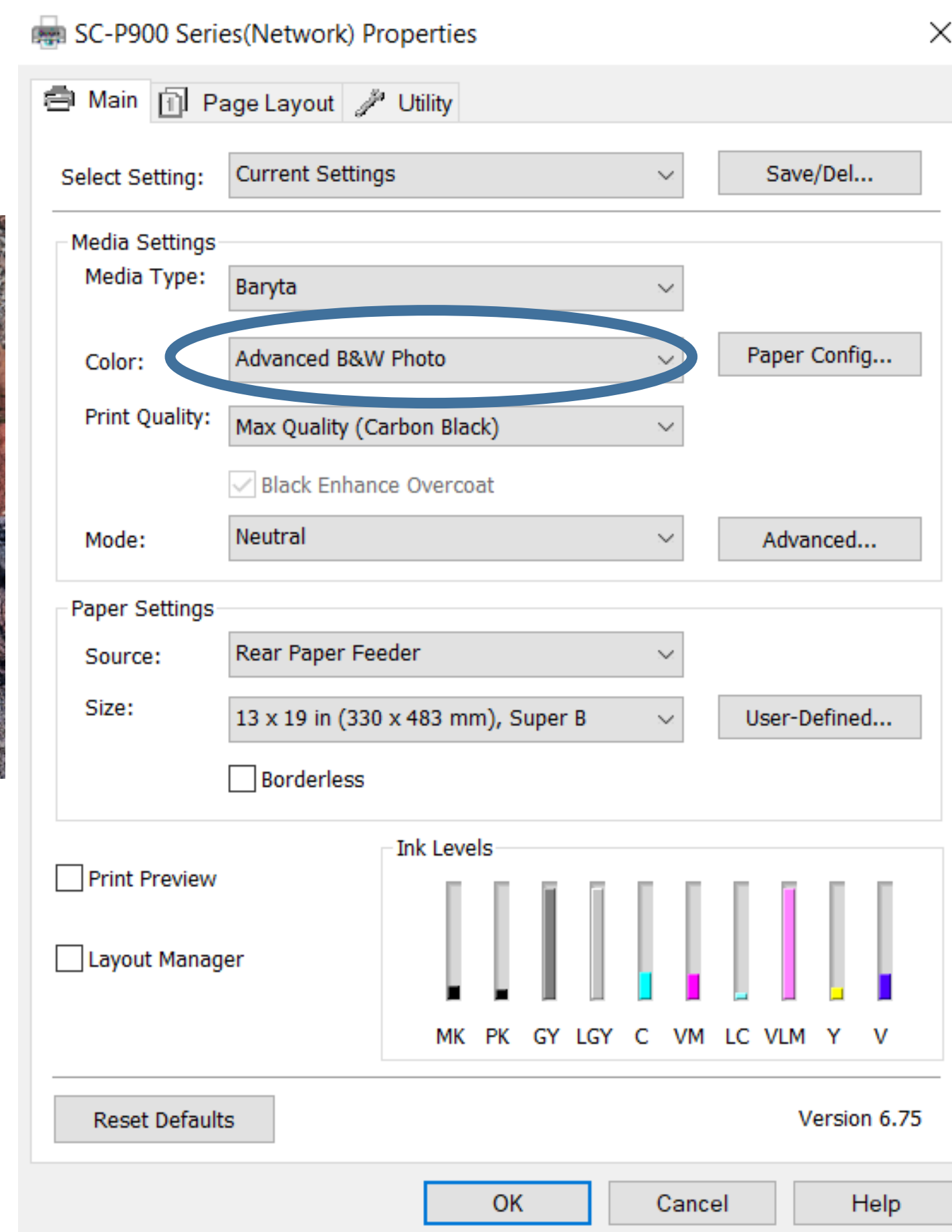
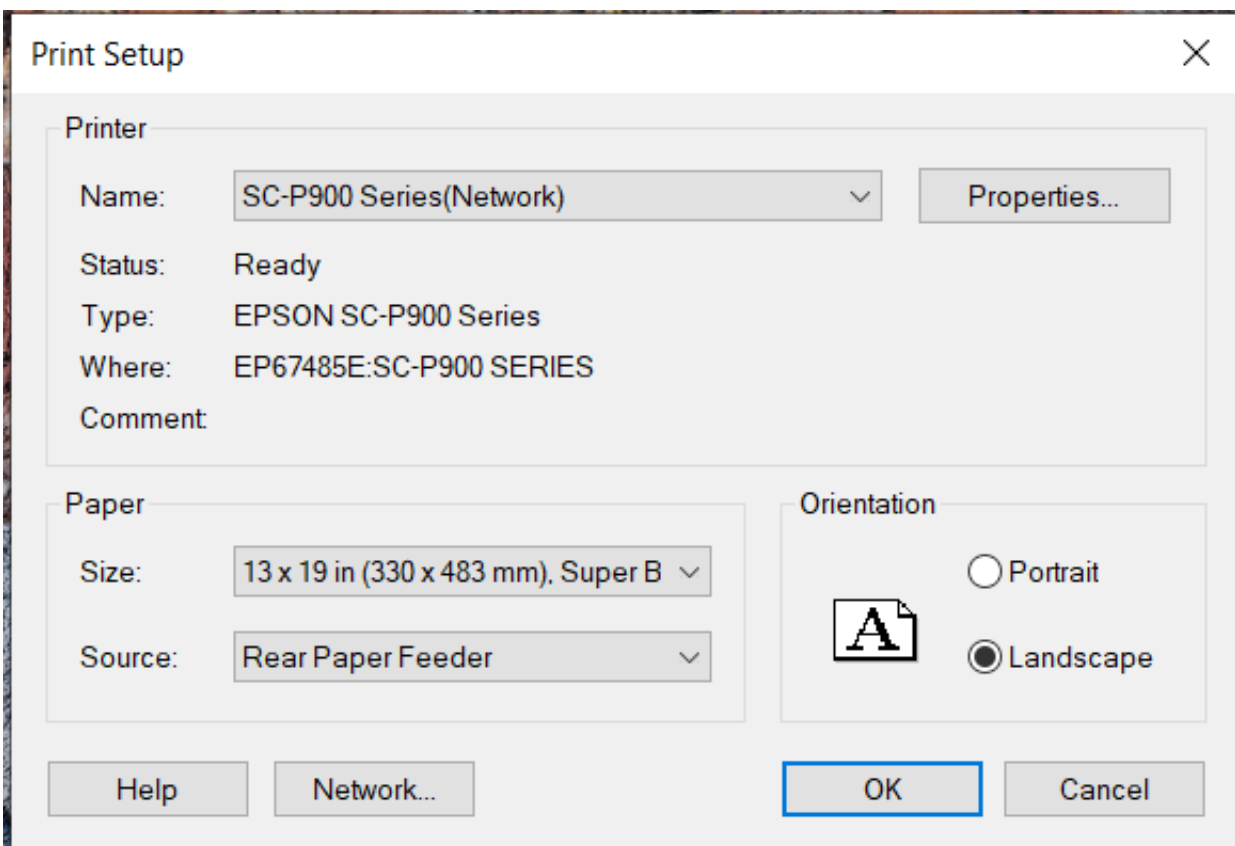


Magenta Tint 5% Sat



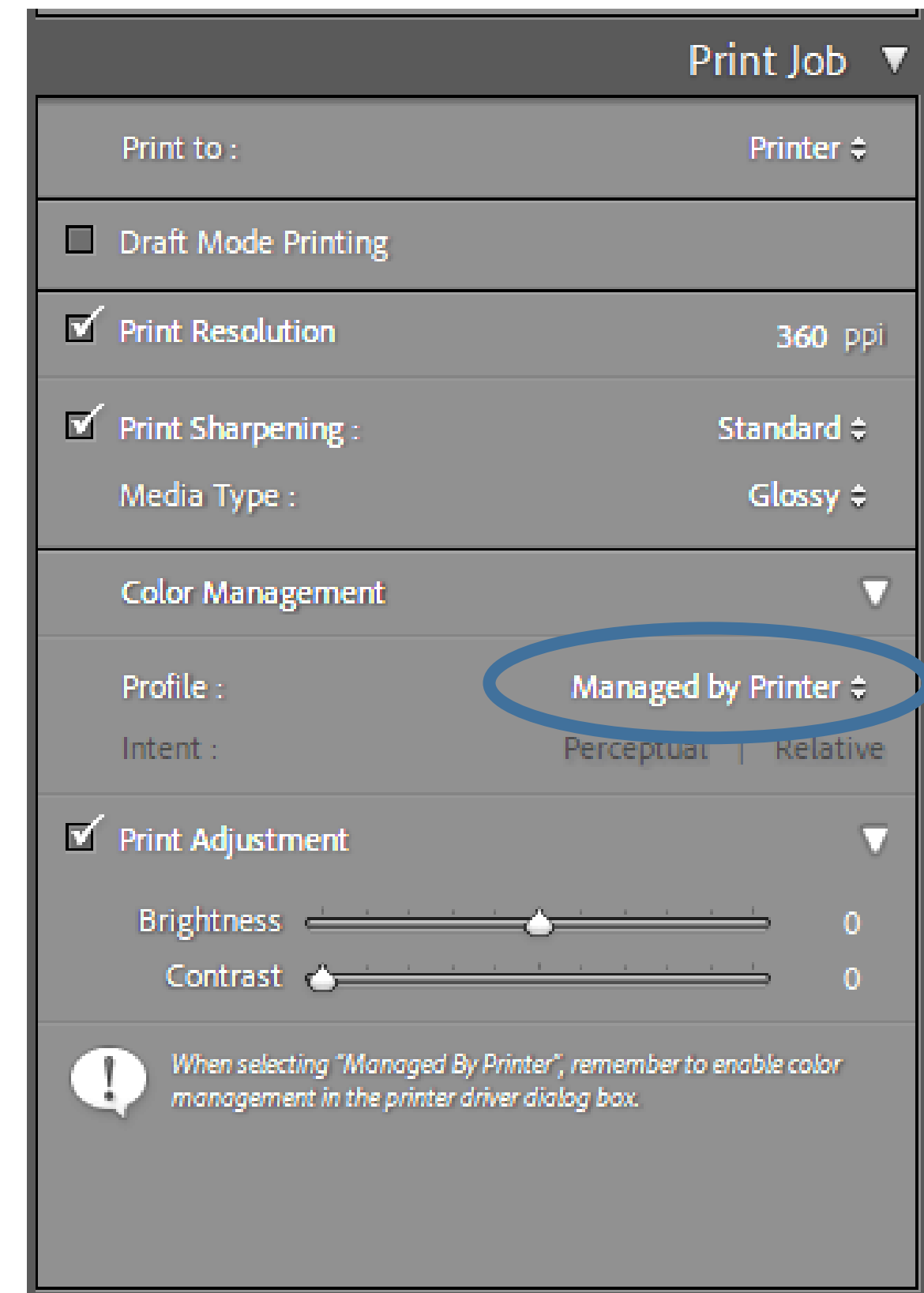
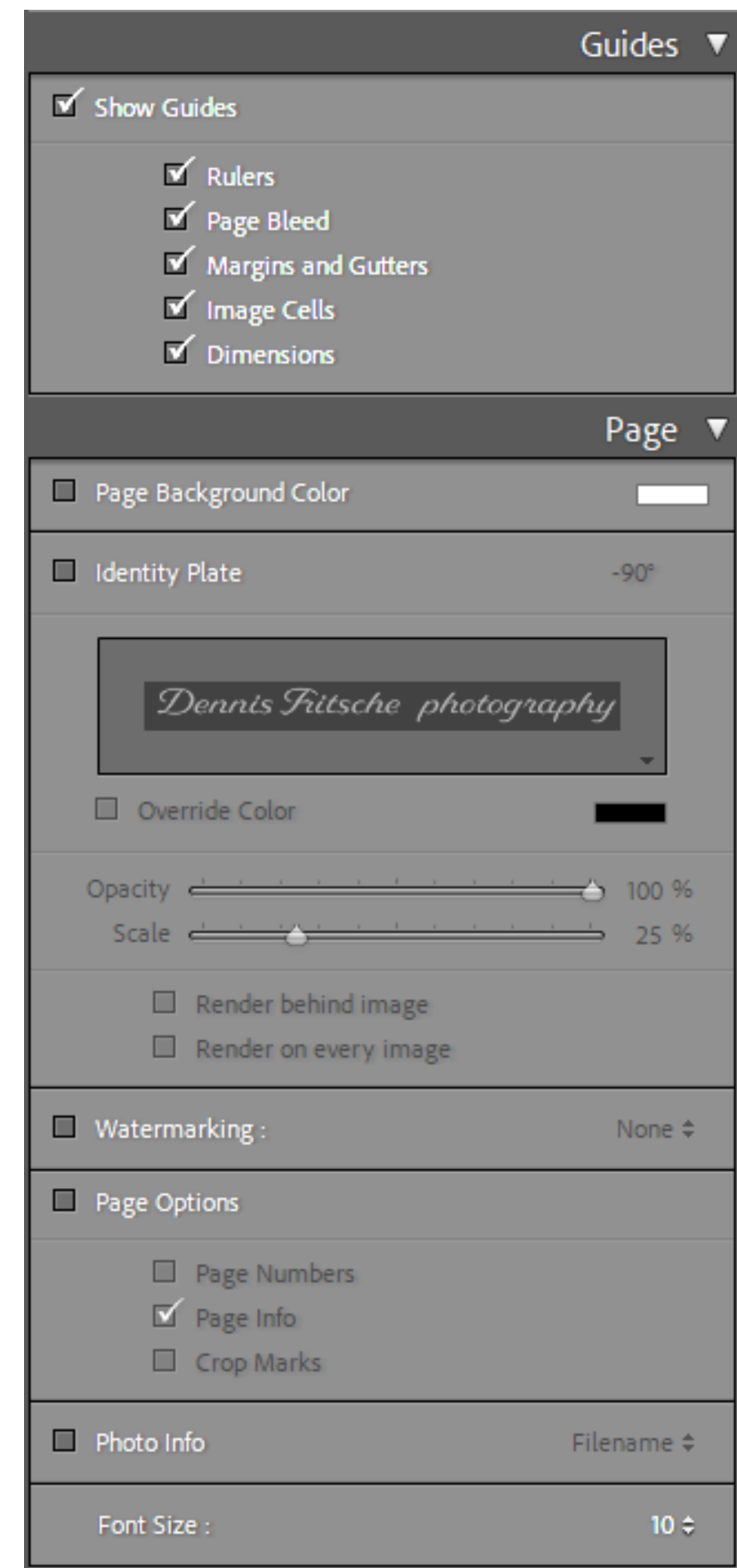
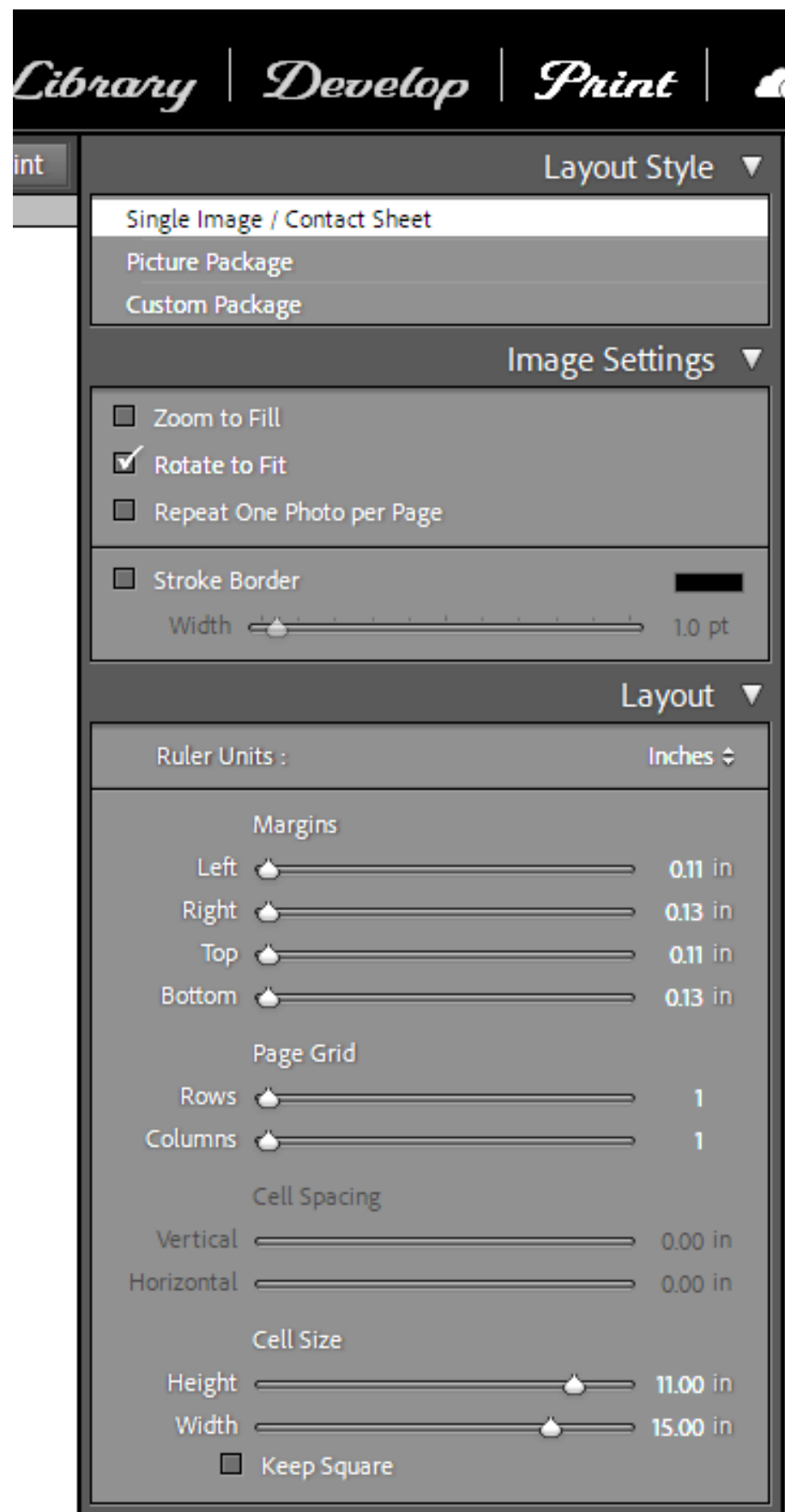


# Printer Set Up and Properties for Epson – B&W





# Lightroom Setup for B&W



# Make a Custom Template

- For each setup make a custom template
- On Template Browset, click “+”
- Give it a name such as “13X19 Canson Presteige ABW”
- When printing again click the template and the printer and LR are setup and ready to go.

# Demonstration

Ordering your print.

Full Color

# Demonstration

Printing to a file to upload to a print service.

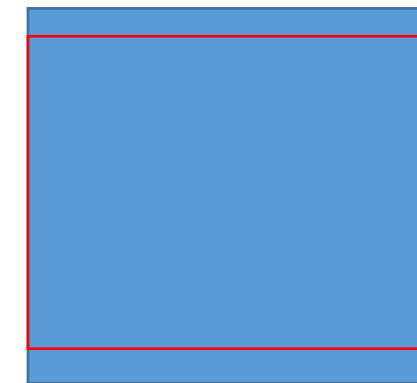
Ordering your print.

Photographique



# Sizing Image for Lab

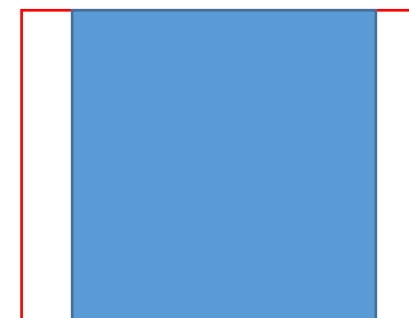
- Use lab recommendations when setting image resolution
- Many commercial labs will size images to fill the frame



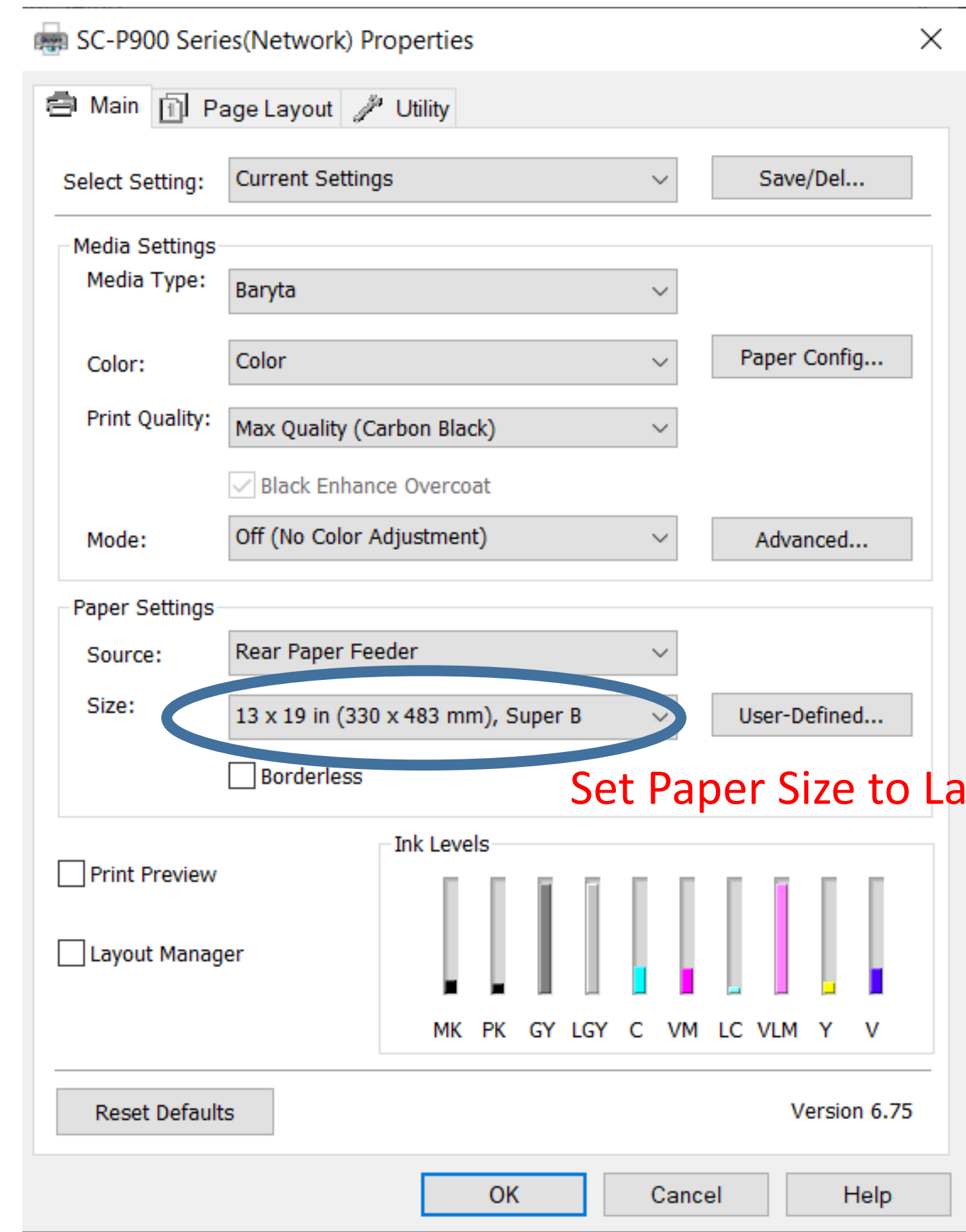
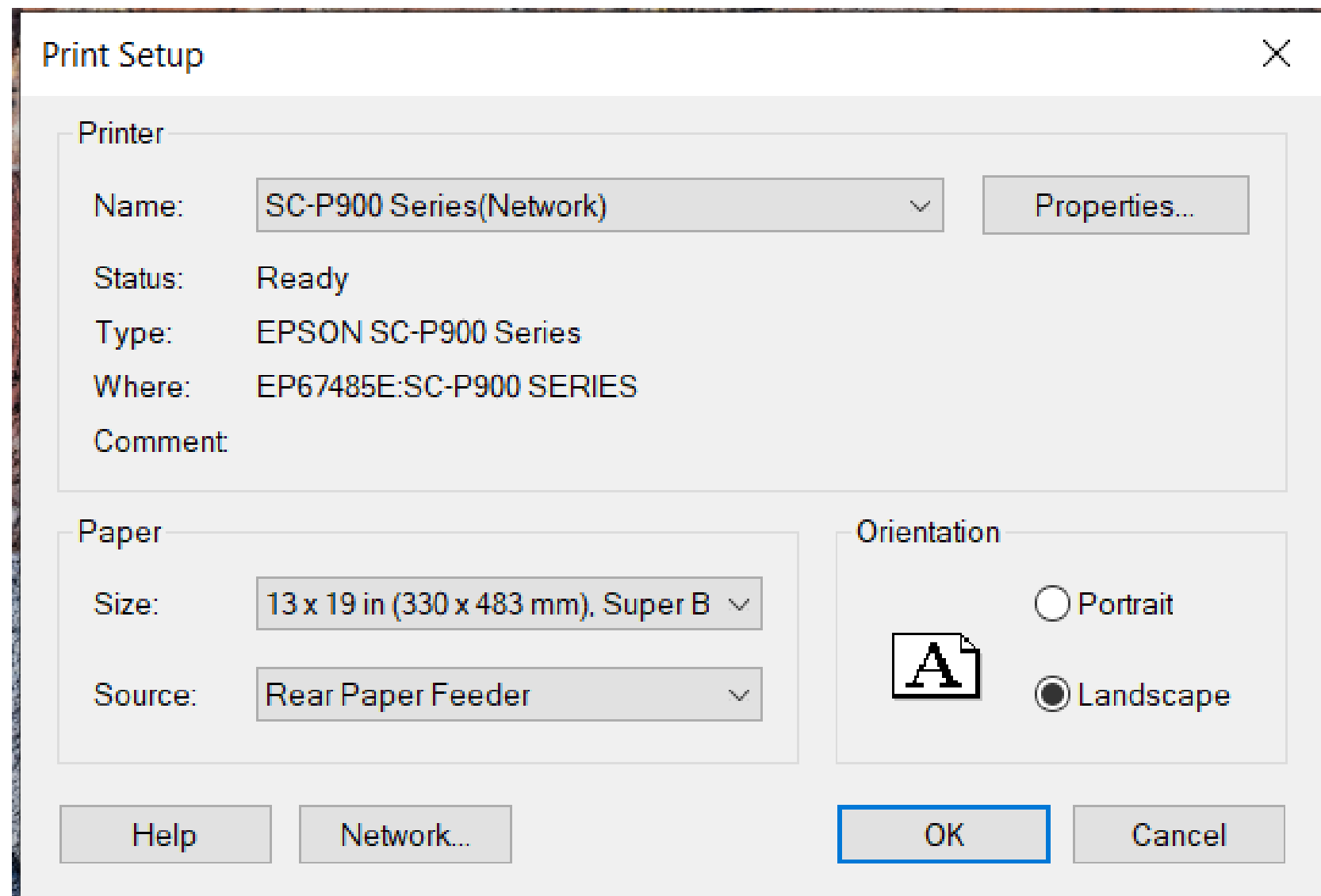
- Use LR or PS to crop your image to the aspect ratio of the final Lab print so you can control crop and fill frame.



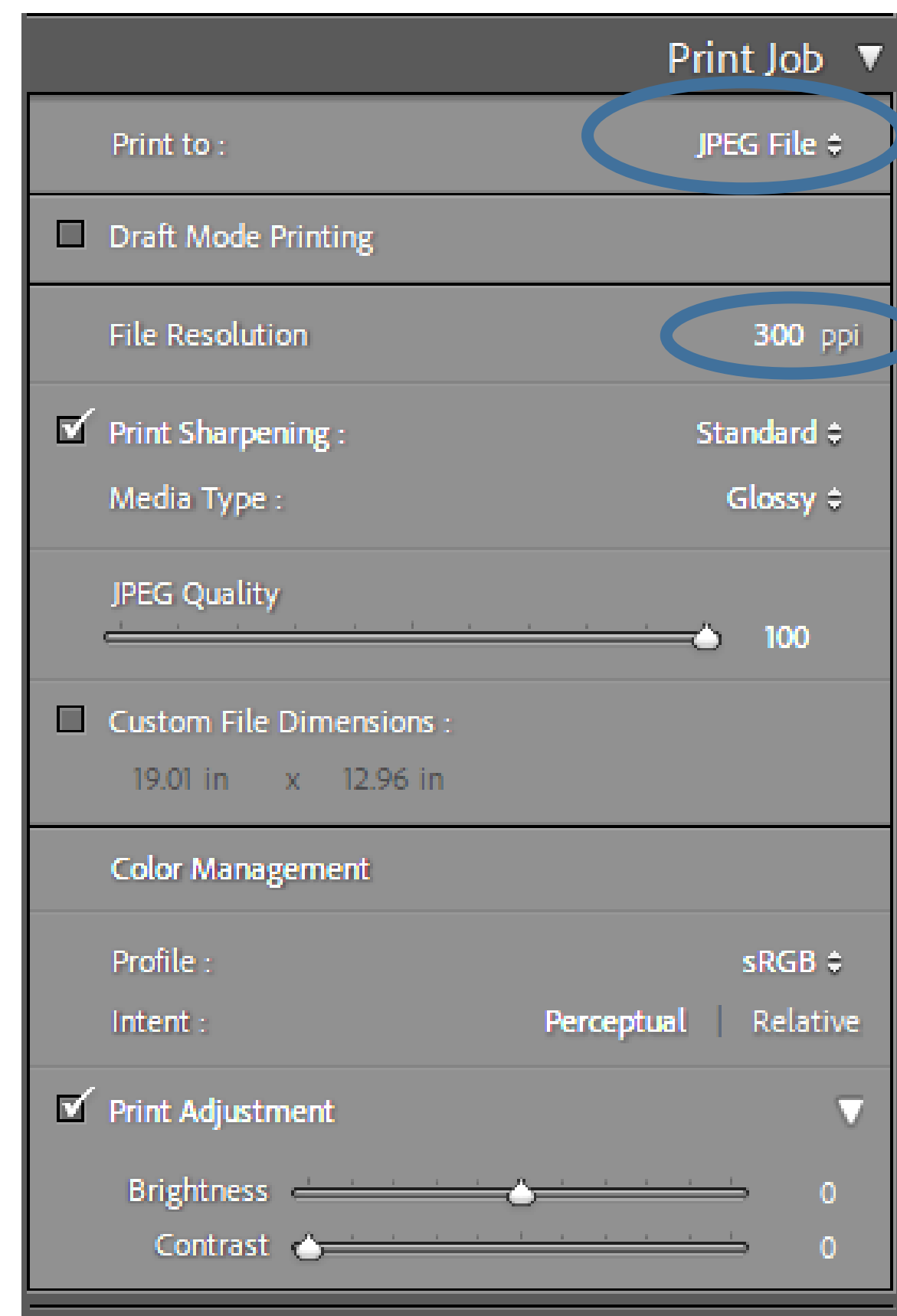
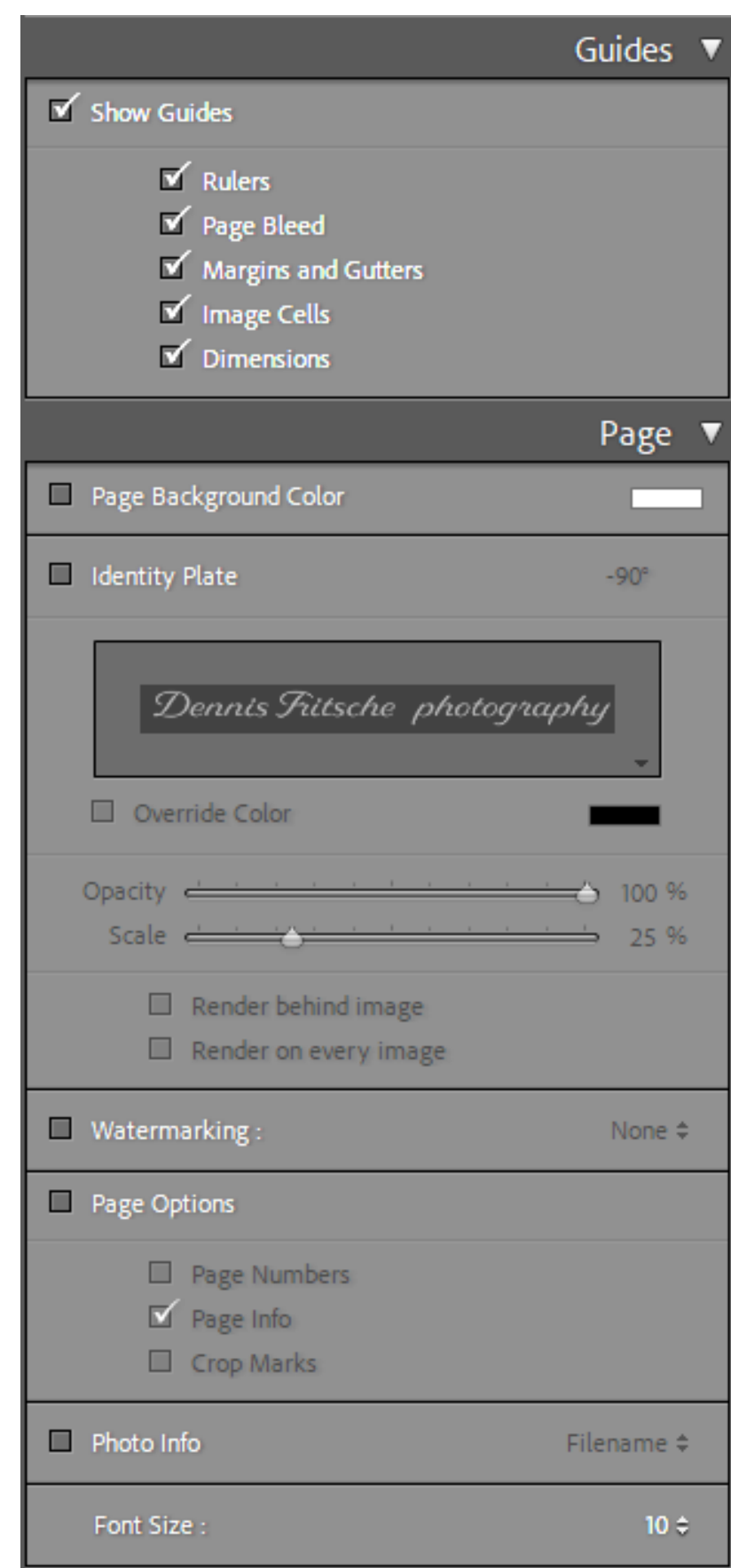
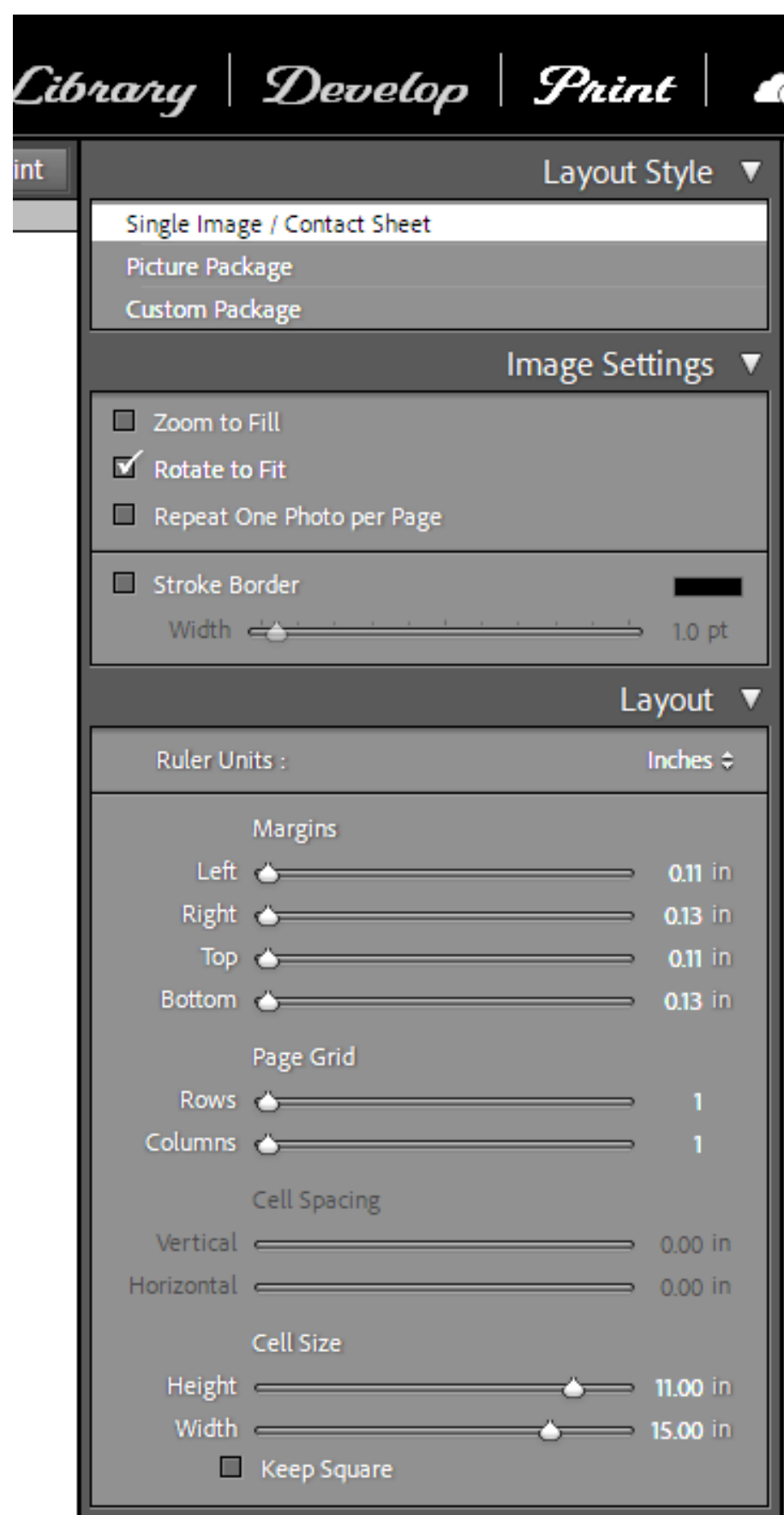
- You can size canvas to print aspect ratio and retain desired print crop in PS
- In LR Print module, size paper to lab aspect ratio and size. Size image with desired crop on the paper and use Print to File



# Printer Set Up and Properties – to File for Outside Lab- Color & BW



# Lightroom Setup for Print to file for Outside Lab



# Experience Ordering Prints from Local Sources

## *(11X14 A Gentle Rain Was Falling)*

- Full Color
  - No special processing needed. Just pay attention to aspect ratio.
  - Order process easy and intuitive
  - Fine art paper
  - \$37.49 (Print \$28, Ship \$6.95, Tax \$2.84) Note a 11X14 on Endura is \$7.40
- Photographique
  - Must prepare jpeg file to fill their paper size
  - Order process relatively easy
  - Kodak Endura paper
  - \$47.61 (Print \$28, Ship \$15.98, Tax \$3.63)
- BWC
  - Unsuccessful in placing order



# Recommended Sources

- Paper, Ink, and Printers
  - **B&H Photo/Video/Audio** <https://www.bhphotovideo.com/>
  - **ITSupplies** <https://www.itsupplies.com/>
  - Competitive Camera
  - Amazon, Adarama, etc
- Mounting and Framing Supplies
  - **Frame Destination** <https://www.framedestination.com/>
  - Michael's etc.
- Printing Services
  - ~~Costco~~, Full Color, BWC Printmakers
  - Online Mpix
- Reference and Instruction
  - The www
  - Red River and Frame Destination have excellent instructions.