

I'm fed-up with the large number of YouTube postings with titles like "Lightroom is Better than Photoshop" or "Which is Better? Lightroom or Photoshop". What bothers me is that Lightroom is not the equivalent of Photoshop! Never has been, never intended to be! Photoshop v. Lightroom debate is a false dichotomy!

Just a note on abbreviations: I will use 'LR' for Lightroom Classic. LR was on the Lightroom icon before the Cloud version was released. It would have been less confusing if LRC referred to Lightroom Cloud, but Adobe thought otherwise. I will use PS for Photoshop, BR for Bridge and ACR for Adobe Camera Raw.

'Lightroom v. Photoshop' is a common belief that these are two distinct digital processing workflows. They are not! The LR Library module is functionally identical to Bridge; the LR Develop module is functionally identical to Adobe Camera Raw. There are technical differences in how these applications work, and you may adopt a preference for one over the other. An in-depth look may help you decide. The 'technical differences' are detailed below.

The important idea is this: If you work with RAW files, you *must* have a digital image workflow to take the RAW images from your camera to a presentation quality RGB image for display or print. The Adobe Photography Plan supplies all the tools mentioned above for both workflows. You can easily work an image with both.

The Digital Image

Your digital camera captures an image using a sensor sensitive to the amount of light striking each of its photosites. For example, a typical 24 megapixel (MP) sensor will be 6,000 photosites wide by 4,000 photosites tall. Each photosite responds only to the brightness of the light striking it. This collection of data from the sensor is called RAW data. RAW is *not* a formally defined image format; each manufacturer creates a RAW image file that has a unique data layout and uses unique codes.

When you trip the shutter, your camera captures the RAW photosite data. If you are saving JPG images, the camera will use the 6,000 x 4,000 photosite values to produce a 6,000 x 4,000 image with pixel values. (A small JPG is *always* produced to show you something on your camera's LCD. A RAW image always has a small JPG 'thumbnail' image embedded in it for preview purposes.)

Note the difference: the RAW file has photosite data, the JPG image has pixel data. ('Pixel' is a shortened form of 'picture element'.) Pixel data requires three values, one for each of the primary colors: red, green and blue (RGB). The process of producing the three RGB pixel values for each photosite value is called demosaicing. To get color information, the sensor's photosite layer is overlaid with a mosaic (checkerboard) pattern layer of red, green and blue filters, with just 1 color per photosite. This is usually a Bayer pattern, but there are others. Look up 'Bayer pattern' and 'demosaicing' in Wikipedia for the details¹!

Your TV, camera LCD or computer use 3 tiny LEDs per pixel, one for each RGB color value, to display full color images. This matches our three color (trichromatic) vision. The RGB values created during

¹ Tip: Create a favorites folder just for the Wikipedia entries I will mention. You may want to refer to these later.

demosaicing are produced by averaging the color and luminance of the target photosite with the color and luminance values of the surrounding photosites. (The color filter over each photosite is included in the image file's EXIF data, as described in more detail below.) The resulting JPG file, or a smaller preview version, is displayed on your camera's LCD panel for you to use to evaluate your image.

This is complicated! Photosite data is linear, human vision is logarithmic. The RAW data must be processed for white balance, color profile, contrast, saturation, and highlight/shadow balance. If your camera offers 'scene modes' or 'picture controls', these options are also applied to the Raw data before the JPG is displayed or saved. You need a small version to display on the camera, and a full-size version to save. Your camera does a lot of work to convert RAW data into a JPG image.

Even when you are simply browsing your RAW images in LR, PS, BR or ACR, the software is showing a JPG image. This may be the embedded preview, or a larger RGB image, for you to look at! Both LR and Bridge start by showing the embedded image, but will begin generating larger versions.

You can choose which version of the image (JPG or RAW) you want to store on your memory card for later use; you may choose to save both! Some cameras may offer TIF instead of JPG. Check the Wikipedia entry for JPEG (Joint Photographic Experts Group) and TIFF (Tagged Image File Format).

If you are curious about the JPG,TIF or RAW choice, the answer is simple. JPG files carry color information in 8 bits per RGB color, while RAW files will use 10, 12 or 16 bits per photosite. (The TIF file on my Nikon is also 8 bits/color. Your camera may be different; check the manual!) This means that RAW files hold more luminance and color information than JPGs. This allows more flexibility when making adjustments to hue and tone in RAW data. Check the Wikipedia entry for Color Depth.

If you use scene modes or picture profiles that apply while shooting, you may not be able to recover the original color data from a JPG or TIF. For example, 'B&W' or 'Carbon' produce grey-scale images. The JPG/TIF files will have no color data, just shades of grey. For RAW files, both LR and ACR apply 'camera matching profiles' that mimic these modes; the RAW files keep the color photosite data and allow you to change to a different profile to get color back.

Save JPG/TIF files if destined for clients or social sites as soon as possible.

Save RAW files for more subtle or dramatic editing. You can save both!

Let me dispel a myth about in-camera JPG images. One YouTuber I followed for a brief time always saved both RAW and JPG files from his camera. He liked to refer back to the JPGs as he processed his RAW files, just to remember 'what it really looked like.' Well, human vision is far more sophisticated than any camera. We can easily see into deep shadows and bright highlights over a 20 stop range. 'Color Constancy' ensures colors look the same regardless of ambient lighting. Genetic issues may allow some people to see fewer or more colors than 'normal'. No current camera, digital or film, can match the human eye.

Nothing you get from a camera is 'what it really looked like'!

Digital Workflows

You *must* use software to process the RAW photosite data into RGB pixel values that can be seen on a computer or printed. Adobe's LR and PS tools fill this need. (There are other software packages that also do this; some are free. RawTherapee, LibRaw, DXO and Skylum products come to mind. The camera's manufacturer may also supply a RAW file editor. But we're only talking Adobe here.)

Finally, we are ready to describe workflow. These are the basic steps that software provides:

1. Move images from the camera or memory card to a computer.
2. Browse the images.
3. Offer ways to rate image quality, delete poor images and add keywords.
4. Use a full-featured color image editor.
5. Use third party software tools for additional capabilities.
6. Save and/or print images in a variety of formats.

Here's the executive summary:

Steps 1,2 and 3: These are carried out by Bridge in the PS workflow and the Library module of LR.

Step 4: This is carried out with ACR in the PS workflow, and the Develop module of LR.

Step 5: Both LR and ACR can pass your images to Photoshop. Both LR and PS can host third party tools or pass images to them.

Step 6: Both ACR and LR can save/export images in JPEG, TIFF, PNG, Digital Negative (DNG) or Photoshop Document (PSD) formats. You print from LR or PS.

The editing tools of Adobe Camera Raw and Lightroom are functionally identical. There are slight differences in the on-screen presentation of some tools, but the underlying editing 'engine' is identical. All the panels and sliders are the same. Both support the same presets and profiles. If you follow tutorials on LR, they will work exactly the same way in ACR, and *vice versa*.

This was not always the case! In earlier versions, LR presets were not compatible with ACR. If you purchased LR presets from a favorite photographer, they would not work in ACR. Over the years, new features appeared in one before they appeared in the other; but this was related to the update schedule, not the goal of equivalent functionality.

But there are differences! LR has modules not available in BR/ACR. These are the Map, Book, Slideshow, Print and Web modules. If you use these modules, LR is likely to be your preferred workflow path. If you are a dedicated BR/ACR workflow advocate, you can still use LR just for these additional tools! PS has advanced features such as 'Content Aware' Fill and Move, the so-called 'Neural' filters and layers for Adjustments, Text and Shapes.

No matter which application you choose to start your RAW processing, you are able to use both to process an image using the strengths of each.

Workflow Details, Steps 1 to 3

The first three steps in both workflows are importing, evaluating, rating and tagging (key words) your images. In Windows, you can configure the AUTOPLAY feature to get your images directly into LR or Bridge.

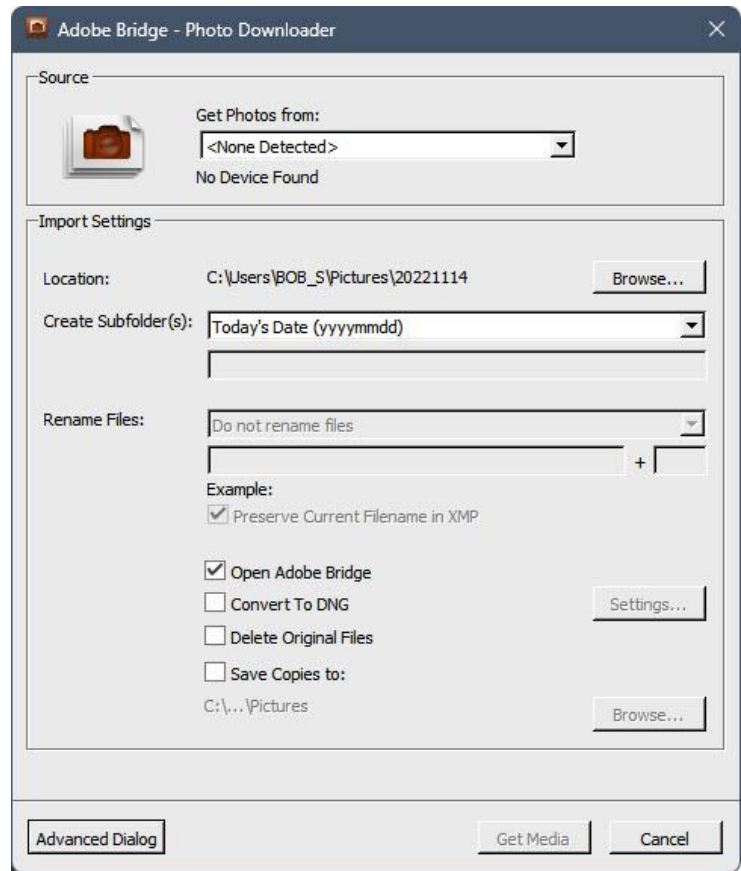
This is the Bridge import dialog in Windows. Both LR and BR want to copy your images to the \Pictures folder. In addition they want to create a new folder based on the current date, in this case '20221114', (November 14, 2022).

This just does not work for me. When I want to review older images, I first think of *where* the images were made, and only later, *when* they were made.

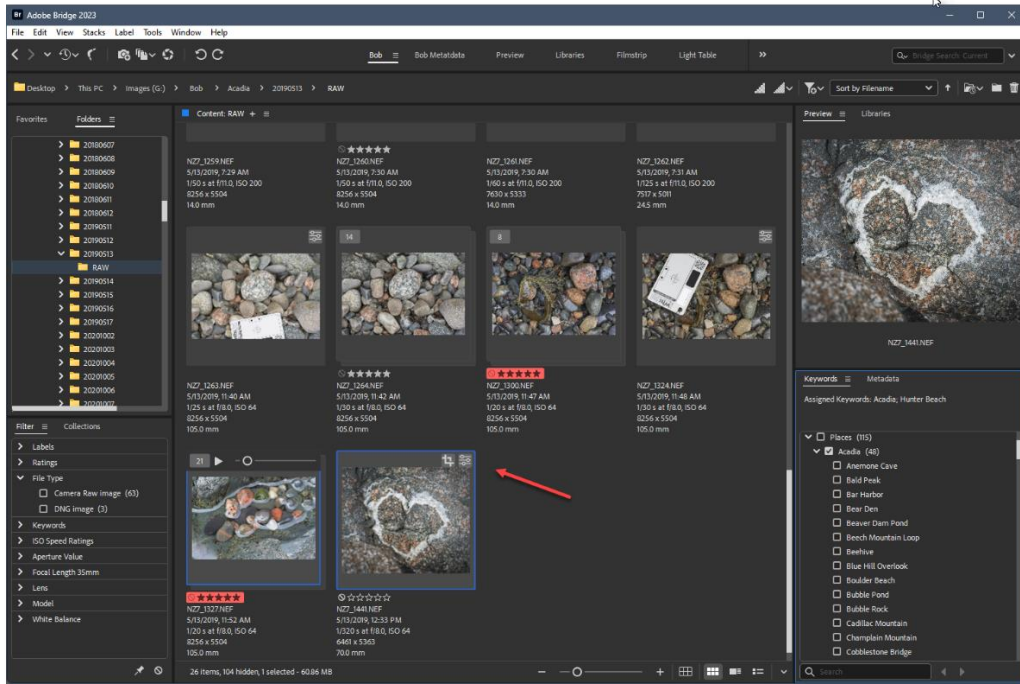
I prefer to store my images by first creating a place name, folder, e.g. Acadia, then a date subfolder and a RAW folder under that. I created this folder structure *before* down-loading from a memory card! With the Open Adobe Bridge option chosen, Bridge will open with the new RAW folder open, and the images displayed. LR displays them in the Library module. Then I only have to use the 'Location:' button to navigate to the proper place for the new RAW files.

By the way, I never store images on the primary drive. I currently have over 6 TB of images, and they simply would not fit there. Instead, I have two 10 TB drives just for images. One is a fast internal drive, the other an external drive that automatically backs up the internal drive. Local drives are far less costly than online storage!

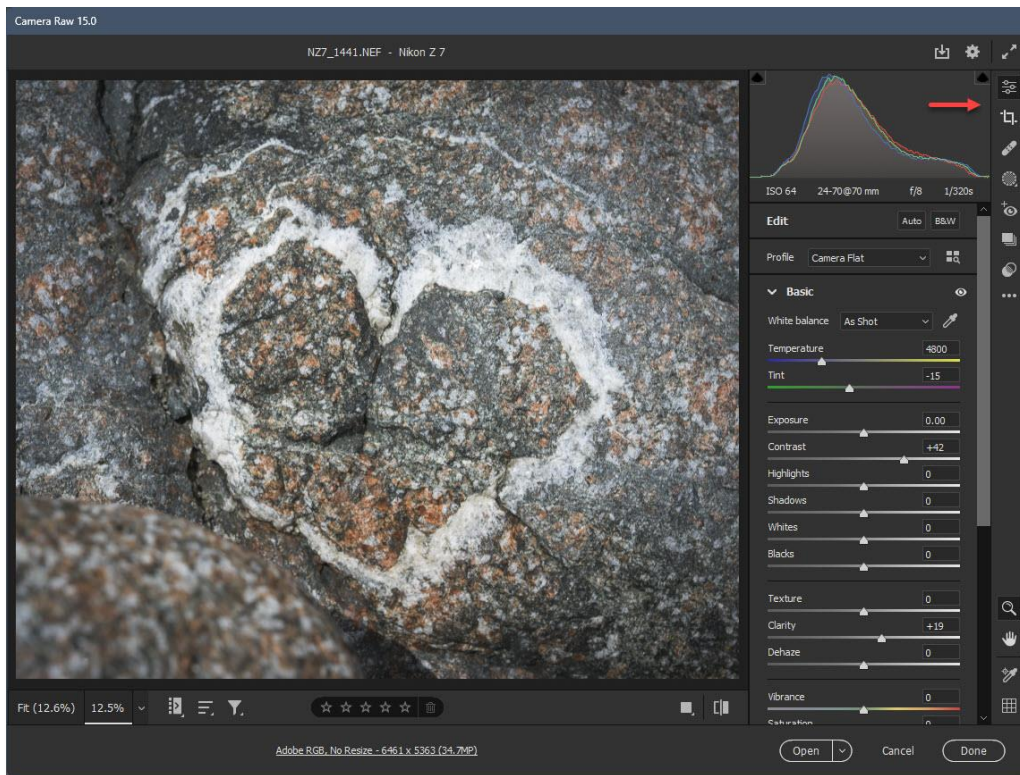
The screen capture on the following page shows Bridge with one of my Acadia folders RAW files from May 13, 2019. The 'Heart of Acadia' image is displayed in the Preview window. The actual file name is [NZ7_1441.NEF](#). (NEF – Nikon Electronic Format). LR users will see something similar². You can see the stars, colors and keywords below.



² Most cameras create files that start with DSC for Digital Still Camera. You can change this in-camera. If you use two or more cameras, you will eventually find name conflicts. I use NZ7 and NZ6 for my two Nikons.



The red arrow points to two small icons on the top, right of the thumbnail image of this RAW file indicating that it has been cropped and some adjustments made.



The red arrow points to the Basic and Crop Panel icons of ACR. The small dots to the right of the icons indicate that adjustments have been made. The Basic Panel is open and adjustments to Color Temperature, Clarity and Contrast sliders have been made.

Workflow Step 4

ACR and LR differ in how they handle image files. To fully appreciate these differences, you need to understand that there is more than just image data in the files produced by your camera. This is 'metadata', or data about data: EXIF data.

When you process your image, more metadata is created. In Bridge, some EXIF data, and the image editing metadata, is stored in an XMP 'sidecar' file. In LR, the EXIF and editing metadata is added to your LR catalog. LR and BR store the same data, but in different ways. Let's look at each.

EXIF Data

EXIF refers to 'Exchangeable Image File Format', which is a formally defined standard for storing in-camera image data. All cameras use this system, regardless of workflow. The EXIF data is separate from the image data; it holds the date and time the image was created, make and model of the camera and lens that was used, focal length, aperture setting, shutter speed, color profile or scene mode, how the Bayer filter colors were spread over the photosites, and much, much more.

For the Heart of Acadia image there are over 300 items in the EXIF data. Some of these data elements will be read by Bridge and used as starting points for editing in ACR. If you used a Scene Mode or Picture Profile on your camera, the name of that profile will be in the EXIF data and used to apply a 'camera matching' preset before you browse your image. Check the Wikipedia entry for EXIF!

However, there are many EXIF data elements that do not get carried forward in RAW processing, some of which are very interesting. Two are shown to the right. I do a fair amount of focus stacking using the electronic front shutter; the mechanical shutter count is much lower. This will supply some insight into shutter wear-and-tear.

---- EXIF ----	
Mechanical Shutter Count :	4656
Shutter Count	: 9971

If you want to explore your camera's EXIF data, download Phil Harvey's ExifTool³. This free tool is updated regularly, so check the URL often. The [exiftool.exe](https://exiftool.org/exiftool.exe) file is a command line tool. If you are not familiar with a command prompt, you can use the GUI interface listed in the footnote. Photomatix and LibRaw's RawDigger also use ExifTool. You may already have one of these. When ExifTool is updated for new cameras, a copy of [exiftool.exe](https://exiftool.org/exiftool.exe) has to be copied into the RawDigger and/or Photomatix folders to keep them current.

As you edit an image, more metadata will be created. These will be the settings you make in ACR or the LR Develop module. How these added metadata are handled is where the two workflows diverge. Later we'll see how they can work together.

³ Phil Harvey's ExifTool: <https://exiftool.org/>
Windows GUI interface: <https://exiftool.org/forum/index.php?topic=2750.0>

BR/ACR : XMP Data and Sidecar Files

When Bridge opens an image for editing in ACR, some of the image's EXIF data and the ACR settings are stored in a new 'sidecar' XMP file in the same folder. The sidecar file for [NZ7_1441.NEF](#) is [NZ7_1441.XMP](#). Same file name, different three letter extension. XMP stands for Extensible Metadata Platform. Check XMP in Wikipedia!

The new masking features of ACR and LR also create new metadata elements. In ACR, these data are stored in a new side car file that ends in 'ACR', e.g. NZ7_1441.ACR. In LR, they are part of the catalog entry.

The XMP and ACR files are not usually displayed in Bridge, although you can set Bridge to show all files in the current folder. If you move or copy an image to another location on your drive, Bridge will keep the RAW, XMP and ACR files together.

Curiously, no, happily, the XMP file is plain text. You can open it in any plain text editor, such a Notepad. [NZ7_1441.XMP](#) has over 350 lines of data; some EXIF data from the camera, all the settings in ACR. This textbox shows a few lines from the sidecar file's XMP data.

Details about the camera are in the **tiff:** lines, lens data is in the **exif:** lines, and the Adobe Camera Raw settings are in the **crs:** lines. *(I added the arrows pointing to White Balance, Crop and other Basic slider settings noted above.)*

The masking ACR files are *not* plain text!

The Synchronize option in Bridge allows you to apply the ACR settings from one image to one or more other images. This is done by copying the values from the crs: lines in the source XMP sidecar file, to the target XMP sidecar file(s). You can also select which values are copied. You may want to copy the Basic adjustments but not the Crop settings.

The Bridge Photo Downloader dialog offers the choice to convert your images to DNG format. DNG stands for Digital Negative, a well defined format developed by Adobe to store RAW data in an open, public domain format. Initially, DNG files were not widely recognized by editing programs. This is no longer true, so may now be workable.

Sidecar data (Original 355 lines)

```
<x:xmpmeta>
---
  tiff:Make="NIKON CORPORATION"
  tiff:Model="NIKON Z 7"
  tiff:Orientation="1"
  exif:ExposureTime="1/320"
  exif:FNumber="8/1"
  exif:FocalLength="700/10"
  exif:FocalLengthIn35mmFilm="70"
  exifEX:LensModel="NIKKOR Z 24-70mm f/4 S"
  exifEX:LensMake="NIKON"

  crs:Version="11.2.1"
  crs:ProcessVersion="11.0"
  crs:WhiteBalance="As Shot"
  crs:Temperature="4800" <----
  crs:Tint="-15" <----
  crs:Saturation="0"

  crs:Exposure2012="0.00"
  crs:Contrast2012="+42"
  crs:Clarity2012="+19"
  crs:CameraProfile="Camera Flat"
  crs:CropTop="0.01073" <----
  crs:CropLeft="0.090129" <----
  crs:CropBottom="0.984979" <----
  crs:CropRight="0.872675" <----
  crs:CropAngle="0" <----
  crs:HasCrop="True"

  crs:RawFileName="NZ7_1441.NEF">
---
</x:xmpmeta>
```

If you open JPG, TIF or DNG files in Bridge/ACR, you will not find companion sidecar files! All three of these image file formats allow storage of metadata along with image data in the same file.

Remember, RAW files are proprietary. If ACR wrote new metadata into a RAW file, it would likely corrupt the Raw file and render it unreadable. Adobe is very respectful of your images!

Lightroom and Catalogs

LR users often say they have their images in Lightroom. This is not quite true. When you 'import' images into LR, you are only showing LR where the files are on your computer. LR notes the location and names of all the files in the folder, then extracts each file's EXIF metadata. It places this information into the active 'catalog'. Your image files, RAW or JPG, are stored on your hard drive, just like any computer file. It's only the camera's EXIF data and the slider/panel data from the Develop module that is stored in the catalog. You can still access these images from Bridge, Photoshop or other editing software if you wish.

Your photos are not in Lightroom, only your metadata is in Lightroom.

This catalog is actually an SQLite database! Using a database has several advantages. Virtual copies are simply multiple records in the catalog holding different editing settings as applied to the same RAW file. Editing a virtual copy does not change the RAW file, just its metadata. As you edit, new virtual copies can be created. A big advantage of the catalog is the increased speed of Smart Collections. This is due to the fast indexing of file attributes and keywords. Smart Collections can be unbearably slow in Bridge!

History and Philosophy of LR & BR/ACR

There really are differences in the two workflows for your RAW workflow. These differences are historical and philosophical but should *not* be considered restrictions. You can, and likely will, work with images with both sets of tools. How this is possible will be covered later.

Photoshop

Photoshop started as a raster (pixel-level) image editor in 1988. It initially worked only on grey-scale images but quickly added the ability to work in color. Thomas and John Knoll started the development of Camera Raw and the DNG file format to access the greater range of photosite data available in RAW images.

By default, PS opens images in pixel (raster) layers (the 'Background' layer). Many of PS's image editing tools still target pixels. PS is very focused on perfecting the pixels of a many-layered image file, such as a magazine cover.

As noted earlier, ACR expects that a RAW file is accompanied by a same-named file with an XMP extension in the same location. The Nikon RAW file [NZ7_1441.NEF](#) above is paired with [NZ7_1441.XMP](#). It is important to keep these files together! If you are curating an exhibit, you may want to move copies of certain images to a dedicated folder. Be sure both the NEF and XMP files arrive together. Bridge handles this for you.

If you open RAW files in PS as a raster layer, all the settings from ACR used to render the image are now 'baked' into the image. It has no 'memory' of ACR. If opened as a Smart Object, the RAW and XMP files are embedded in the current PS document. You can double-click the Smart Object

layer and it will open in an independent version of ACR. In both cases, you can open the same RAW file again in ACR, make different adjustments, and create a new PS document with a different interpretation.

Be careful! If your Smart Object layer refers to a RAW file by reference (linked, not embedded) you must keep the RAW and PS files together. Subsequent editing of the linked RAW file will affect the PS file! Video editing in PS works this way.

PS has extensive features that are only indirectly related to photographs, *per se*. These include pre-press CMYK printing, spot colors, forensic analysis, and 3D. These features that will never be in LR. (In fact, 3D will soon be removed from PS. Expect a new 3D app in the future.) So, yes, PS is bigger, intimidating and more complicated than photographers need. (You might try choosing the Photography option under the Window, Workspace menu to reduce menu and panel clutter; or build and save your own workspace!)

Lightroom

Mark Hamburg, an ACR programmer, wanted to develop a new photo application that would avoid the complexity of PS, and be enjoyable to use. He had visited many working, high-volume photographers to learn what the 'pinch-points' were in PS, add additional tools, and improve tools in PS, e.g. a faster file browser. This new application, code named 'Shadowlands', was eventually released as Lightroom in 2007.

Adjustments in ACR are really only changes to the XMP data, not the actual photosite data. Your editing settings are applied to the image as it was being rendered for the screen. LR takes the next step; it stores metadata in the catalog (database), ending the need for a sidecar XMP file. This enabled virtual copies as the simple, additional data row in the catalog for a single RAW file, not a copy of the original file. Certainly saves disk space! Like ACR, LR does not change the underlying image data; both are non-destructive.

If you travel and import images into LR on a laptop, you have to follow a specific path to move the files and the catalog entries to your desktop when you get home. If you move only the image files, or only the catalog, LR may no longer be able to find your original file or its adjustments.

LR catalogs can get corrupted. LR takes great pains to make periodic backups of your catalog(s). The Adobe help pages for LR have hundreds of entries for this issue. LR goes to great lengths to assure the integrity of its catalogs. Truly unrecoverable catalog damage is usually caused by hardware level failures.

Step 5 - Third Party Software

There are a number of third party tools that work with LR and Photoshop. They may show up as a Panel, a menu item, or a script. Topaz, NIK, Lumenzia and Luminar are examples. I have had problems with third party software: they may go out-of-business, or do not update for new versions of PS and LR. New versions may not be backward compatible with old versions!

This last issue hit me hard when an updated version of the NIK utilities did not recognize Smart Object NIK layers from the earlier version. I've been using the original NIK utilities for years. I first bought a version from NIK, then got the free version from Google, then bought NIK 3 when DXO

bought the rights from Google. But when NIK 4 was released, it would not allow any changes to NIK 3 Smart Object Layers. This orphaned a large number of image files!

Nik recently confirmed that the new NIK 5 is not backward compatible with NIK 4! This is appalling! NIK even emphasizes the non-destructive nature of NIK Smart Objects! You could say that losing the ability to rework older images does not destroy data, but it does destroy any opportunity for further changes. These days I only keep NIK 3 on my computer to remove the NIK Smart Object layers from older images and duplicate the effects with a Camera Raw Smart Filter.

Happily, many third party tools create 'real' PS layers so do not cause similar problems. Both of my luminance mask apps, Lumenzia and TK, work this way! Never a problem.

Step 6 - Save/Export

Both LR and ACR have the ability to Export or Save a file. This ACR screen capture shows the down-pointing arrow in the thumbnail. It's also shown on the toolbar at the top, right of the ACR window. This matches the similar Export function of LR.



ACR and LR can save / export images in JPEG, TIFF, PNG, Digital Negative (DNG) or Photoshop Document (PSD) formats.

XMP v. Catalog - Are they really equivalent?

We've seen that LR and ACR both use the same set of EXIF information from a digital image and add data from the sliders and panels. LR stores this data in a catalog, ACR stores the data in an XMP sidecar file. The data is essentially the same, but they don't really seem to be shared.

- If you have been editing in ACR for a while, and now want to switch to LR, will you need to re-edit older images from scratch to get the matching XMP data into the catalog?
- If you've been using LR for a while but now find you are using the 'Edit in Photoshop' option most of the time, you might want to follow the BR/ACR/PS workflow ... but your editing changes are in the catalog. Can you move them to an XMP file?

Well, turns out it's easy to move this data both ways! If you have a folder of images that you have edited in ACR, each will have an XMP sidecar file. When you import that folder into LR, it will read all the XMP files and add that data to the catalog!

Lightroom can create an XMP file for the image you are working on! Look under the Metadata menu for the 'Save Metadata to File' (Ctrl+S) choice. ACR will then open this image with the correct settings! Look under the LR Edit menu for Catalog Settings and open the dialog. You will find a checkbox for 'Automatically write changes into XMP' on the Metadata tab. Your XMP sidecars are automatically created for you!

Some cautionary words: ACR does not know if an image has a record in a LR catalog. However, LR will know if an image has been edited in ACR when it finds an existing XMP sidecar file. LR will warn you about the differences between the catalog data and XMP data if, 1) the image has been edited in ACR after the catalog record was created, or 2) saving the current catalog data to an XMP file

will change the XMP file on the drive. You will be asked to confirm which settings you want to be current.

Summary

Bridge and Adobe Camera Raw are equivalent to the Lightroom Library and Develop modules. Choosing LR because of the complexity of PS is no longer valid. The BR/ACR and LR/Library/Develop workflows require the same knowledge and skill. All the editing skills you have in LR will apply in ACR, and *vice versa*. A 'final' image in LR is functionally identical to a 'final' image in BR/ACR. The BR/ACR workflow does *not* require that it be opened in Photoshop!

You can base a choice on Lightroom's additional modules for Maps, Books, Printing and creation of Web Galleries, or PS's advanced features such as 'Content Aware' Fill and Move, the so-called 'Neural' filters and layers for Adjustments, Text and Shapes.

From Lightroom and ACR to Photoshop

There are reasons to use PS to supplement LR (and ACR). PS offers 3 merge options for panoramas: Spherical, Cylindrical and Perspective. PS adds three more: Auto, Collage and Reposition. The Collage option creates David Hockney style output from many images. Reposition does not warp frames in any way and works well for telephoto panoramas. Both need to use PS to open multiple images for Depth-of-Field stacks.

Luminance masks are a popular technique. These are often applied to an Adjustment layer in PS. LR images can access this capability with the 'Edit in Photoshop' option of LR. When finally saved, PS returns a TIFF to LR. If you wish to re-edit this image in PS, choose 'Edit in Photoshop', then select the 'Edit Original' option. This opens the TIFF file with all its layers and Smart Objects. This applies to DoF stacks if you wish to keep the individual layers. There's a surprise ... TIFF supports layers! In fact, the Photoshop PSD file is a proprietary version of a layered TIFF file.

From Photoshop to Lightroom

One photographer I follow does all his RAW work using the BR/ACR/PS workflow but prints from LR! (I also follow one who uses LR but prints from PS!) If you like LR's Book module, you might create a folder dedicated to the book's images and copy your ACR edited Raw & XMP files there. As noted, when imported, LR finds and reads the XMP file, and adds your ACR setting to the catalog! No need to duplicate your RAW processing! And of course, LR understands Photoshop's PSD files.

My personal workflow is BR/ACR/PS. I started using PS long before LR became available. I was comfortable with panoramas, HDR and DoF stacks in PS, so no real reason to add LR to the workflow. I always open my RAW files in PS as Smart Objects. Double clicking the Smart Object thumbnail will re-open the embedded RAW and XMP data in ACR. A LR user might think of this as adding LR's Develop capability to a Smart Object! Perhaps moving to ACR would not be very uncomfortable.

It's time to stop thinking "Lightroom *or* Photoshop". This is an artifact of history. It's now "Lightroom *and* Photoshop". I prefer to think that both ACR and LR provide access to PS's 'advanced' features and capabilities.