

AI based Noise Reduction, Sharpening & Upsizing for Wildlife Photographers

Peter Batty • MHWPC Digital Training • May 12, 2026

Today's Session

- **Comparison Website**
 - Full-resolution examples you can explore
- **Key Concepts**
 - Noise, sharpening, upsizing — and how AI changes things
- **Demos and Comparisons**
 - Demos and comparisons of Lightroom Classic, DxO PureRAW, Topaz Photo, ON1 RAW
 - First for Noise Reduction and Sharpening, then for upsizing
- **Summary and Recommendations**
 - Which tools, when, and why

Full-Resolution Comparisons

- pmbatty.github.io/battyphotos
- Every example from today — all tools, all settings — at full resolution.
- Side-by-side comparison mode with synchronized zoom.
- AI-generated critiques from darwain analyzing each variant.

- *Open the link now if you'd like to follow along — or explore it at your own pace after the session.*

Key Concepts

What you need to know before we dive into tools

Why This Matters

- AI has transformed noise reduction, sharpening, and upsizing
- We can dramatically improve some existing images, in some cases rescuing images that weren't usable before
- We can change the camera settings we use with the knowledge of what these tools can do — in particular not being afraid to shoot with higher ISO
- Heavier crops become viable with AI upscaling

Ethics & Contests

Generally Accepted

Noise reduction — seen as improved version of existing tools. Modest sharpening for slight softness.

Grey Area

Aggressive AI sharpening, motion blur recovery, and upsizing — the AI is inventing plausible detail. Most contests don't specifically address this in their rules yet.

MHWPC Contest Rules

*Images may be enhanced using any post-processing tools, except you cannot copy or significantly alter the primary subject, nor import from another image. **The intent of the original must be maintained.***

No restrictions for the Creative category.

For club work: currently the tools we show today are fine, but as a club we will need to think about rules going forward. More creative generative AI tools are more problematic.

How AI Tools Are Different

Noise Reduction

Traditional NR applies spatial filtering — averaging nearby pixels, which smears fine detail. AI NR predicts what the clean image should look like, preserving feathers, fur, and texture.

Sharpening

Traditional sharpening enhances edge contrast — it can't add detail that isn't there. AI sharpening can recover or generate plausible detail from soft or blurred originals.

Upsizing

Traditional upscaling interpolates between pixels. AI upscaling generates plausible new detail — enabling larger upscaling of heavy crops.

How They Work

Trained on millions of before-and-after image pairs, AI models learn to predict the improved version. Some can denoise, sharpen, and upscale simultaneously.

Four Tools

Live demos + comparison results from the website

The Tools We're Comparing

Adobe Lightroom Classic

AI Denoise • Super Resolution
Built-in, non-destructive, no extra cost



DxO PureRAW

DeepPRIME XD3 • Lens corrections
Works on RAW • \$129 one-time



Topaz Photo

Denoise • Sharpen • Upscale
Best sharpening • ~\$199/yr subscription



ON1 Photo RAW 2026

NoNoise AI • TackSharp AI • Resize AI
Non-destructive • ~\$100 perpetual



1: Lightroom Classic

Non-destructive AI Denoise function (since June 2025)

2025-05-12-Bandhavgarh-Q1013570.orf

5/12/25 5:24:57.000 AM

2883 x 2162



Demo

Histogram

Highlights 0
Shadows 0
Whites 0
Blacks 0

Presence
Texture 0
Clarity 0
Dehaze 0

Vibrance 0
Saturation 0

Tone Curve

Color Mixer

Color Grading

Detail

Denoise 50
 Raw Details
 Super Resolution

Sharpening
Amount 40
Radius 1.0

Previous Reset

Lightroom Classic AI Denoise

Strengths

- Quick and simple
- Surprisingly good — holds up well against specialized tools
- Built into Lightroom — no extra cost, no export/import workflow
- Fully non-destructive
- Can apply at any stage of editing

Limitations

- AI Denoise works on RAW only
- Limited control — just one strength slider
- No AI sharpening for missed focus or motion blur
- No localized/selective processing
- Not directly compatible with Lightroom “Super Resolution” upscaling (except by saving file as TIFF or other first)

2: DxO PureRAW

RAW pre-processing with lens and camera mathematical model foundation

DxO technologies



Lens sharpness optimization

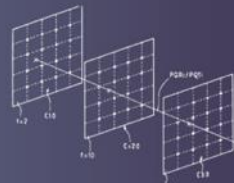
Unlike other software, DxO's lab-crafted adjustments do much more than apply uniform sharpening across the whole image.

Discover >

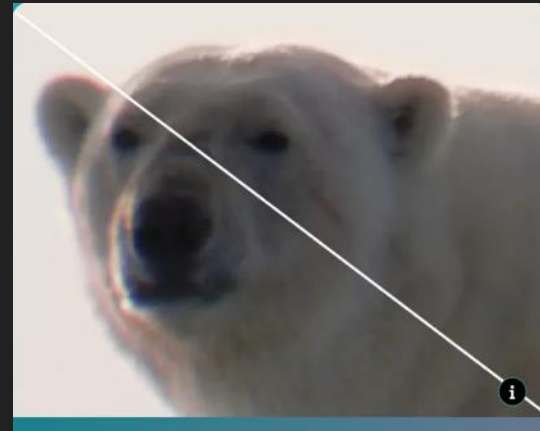


Distortion correction

Photographs retain more of the original field of view after cropping thanks to the precision of DxO Modules.



Discover >



Chromatic aberration

Solve transverse and axial chromatic aberrations caused by imperfect spectral refractions.



Discover >



Vignetting rectification

Deal with the progressive loss of luminance seen in photographs made with wide angle, zoom, and telephoto lenses.



Discover >

<https://www.dxo.com/dxo-pureraw/technologies/>

DxO Modules – a foundational element

Invented in 2004, the DxO Camera and Lens Module is a **mathematical model of unparalleled precision** that captures the unique characteristics of a specific camera and lens combination. It describes the **properties of the sensor** — its noise performance, color response, and dynamic range. And it describes **properties of the lens** — sharpness uniformity, distortion, vignetting, and chromatic aberrations.

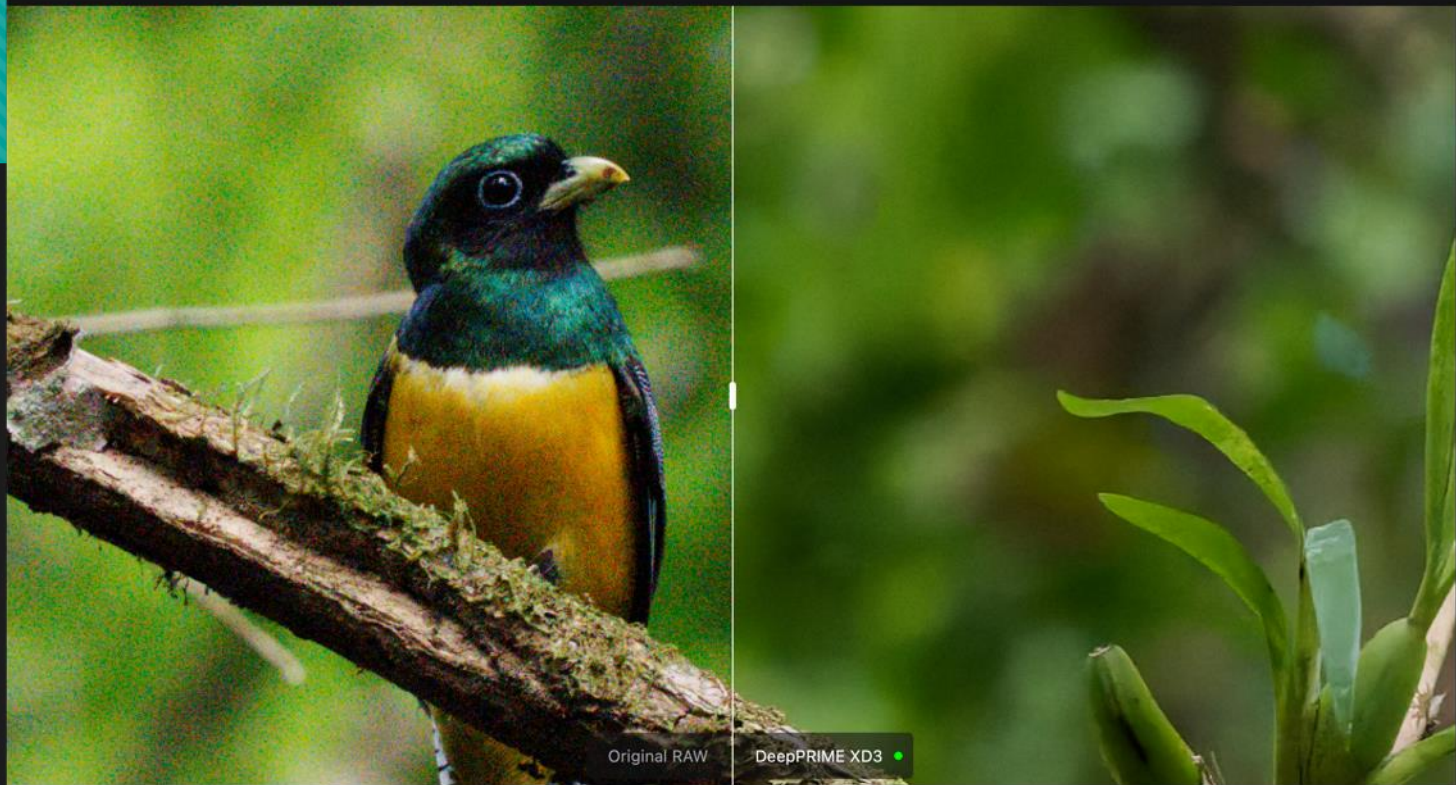
The performance characteristics depend on:

- capture parameters (focal length, focal distance, shutter speed, etc.)
- combination of lens and sensor
- position in the field of view

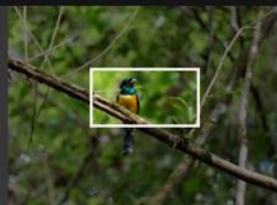
As a result, modelling these characteristics requires you to take **measurements at every ISO setting, focal length, aperture, and focusing distance**. Not only that, but we also need to test for **every combination** of lens and sensor, and for every part of the sensor's field of view. The level of detail is immense.

< Back

100% 100%



Original RAW DeepPRIME XD3



Preset

DeepPRIME XD3 - DNG

Processing & Denoising

DeepPRIME 3 DeepPRIME XD3

Luminance 40

Force details 0

Optical Corrections

Lens Sharpness Optimization

Standard

Intensity +100.0

Vignetting

Chromatic aberration

Lens distortion

Image cropped to original ratio

ReTouch

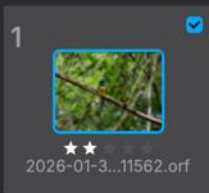
Dust removal

Sensitivity 20

Demo

1 of 1 selected

Show only selected



2026-01-3...11562.orf

DxO Pure RAW

Strengths

- Outstanding quality for noise reduction and moderate sharpening
- Relatively quick and simple
- More options available than Lightroom
- Can run in batch
- Doesn't introduce artifacts like Topaz can
- Creates DNG files
- Can sharpen more than I expected with "Strong" and "Hard" settings
- Consistently wins in my AI rankings and in most reviews

Limitations

- No aggressive AI sharpening for bad cases of missed focus or motion blur
- No localized/selective processing

\$129 one-time purchase

No subscription required

14 day free trial

3: Topaz Photo

The AI sharpening leader



Demo

Original



Autopilot

Here are some suggestions of what to do next...

- ↗ Upscale
- 🌐 Denoise *all*
- + Choose something else

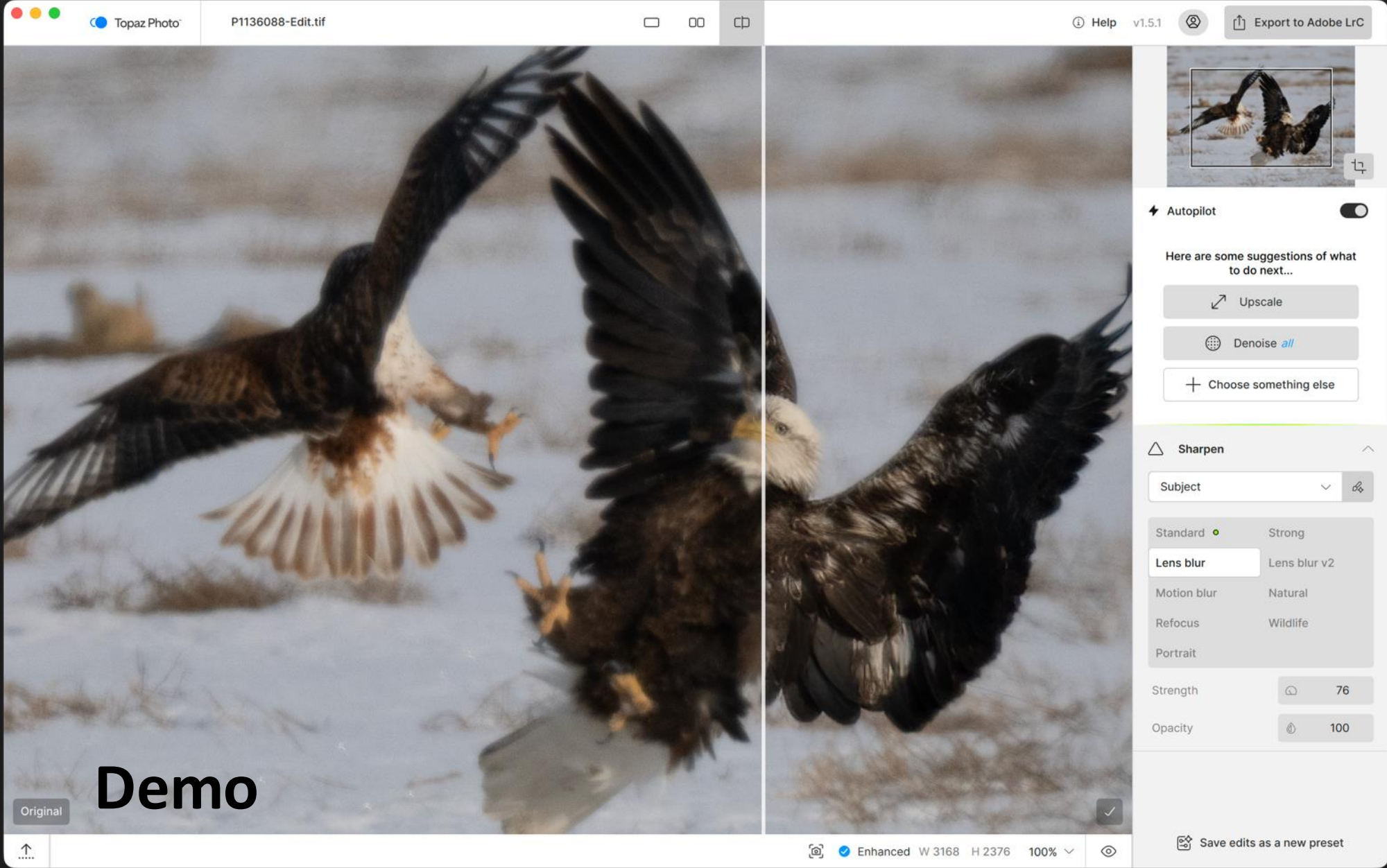
Sharpen

Subject

- Standard Strong
- Lens blur Lens blur v2
- Motion blur Natural
- Refocus Wildlife
- Portrait

Strength 49

Opacity 100



Original **Demo**

Autopilot

Here are some suggestions of what to do next...

↗ Upscale

🌐 Denoise *all*

+ Choose something else

Sharpen

Subject

Standard Strong

Lens blur Lens blur v2

Motion blur Natural

Refocus Wildlife

Portrait

Strength 76

Opacity 100

Enhanced W 3168 H 2376 100%

Save edits as a new preset



Original

Demo



Autopilot

Here are some suggestions of what to do next...

↗ Upscale

🌐 Denoise *all*

+ Choose something else

Sharpen

Subject

Standard Strong

Lens blur Lens blur v2

Motion blur Natural

Refocus Wildlife

Portrait

Strength 50

Opacity 100

Topaz Photo — Strengths

- AI sharpening can recover missed focus and motion blur in many cases
- Multiple AI sharpening models including Lens Blur, Motion Blur, Wildlife (new)
- Simple, effective masking
 - Sharpening on subject only is desirable in many wildlife scenarios
- Integrated upscaling up to 6x

Selective processing workflow options

- **Whole Image**

- Denoise all → sharpen all. Simple but can introduce artifacts.

- **Subject-Only Sharpen**

- Denoise all → sharpen subject only. Topaz default — avoids sharpening bokeh.

- **Split by Region**

- Denoise background only → sharpen subject only. Can be helpful in some situations where subject has delicate textures that get smeared with Denoise

Topaz Photo — Cautions

- Default settings often too aggressive
 - Can over-sharpen and introduce artifacts
 - Consider reducing sharpening strength from recommended values
- Be wary about sharpening images that are already sharp — easy to overdo
- Noise reduction can smear detail more than Lightroom or DxO in some cases
- Topaz has a history of changing product line frequently – various products have been discontinued and you need to upgrade to newer ones

Keep in mind that viewing context matters. An image that looks "over-sharpened" at 100% may look better than a softer version at contest resolution (1400×1050) or on social media.

Subscription ~\$199 per year
No more perpetual licenses (except for legacy products)

4: ON1 Photo RAW

The all-in-one alternative

Search Current Photos

None Text Attribute Faces Metadata

None

Nav Levels Info History Snapshots

- Browse
- Edit
- More
- Crop
- Transform
- Super
- Mask
- Retouch
- Liquify
- View



Open

Revert

Develop Local Effects Sky Portrait

Brilliance AI

Tone & Color

Noise & Sharpening

Classic NoNoise AI Tack Sharp AI Both

Apply

Noise Reduction

NoNoise AI Model 2024 ...etail Auto On

Luminance 100

Enhance Detail 0

Color 100

Sharpening

Tack Sharp AI Model 2024

Tack Sharp AI Deblur 100

Micro Sharpening 100

Lens Correction

Transform

AI Resize Print Share Export

Demo

ON1 Photo RAW 2026

Strengths

- Lower cost alternative to Topaz, with AI sharpening capabilities that Lightroom and DxO don't have
- Some additional capabilities in Resize AI compared to other options (tiling, print wrap)
- Full photo editing and management tool that combines many elements of both Lightroom and PhotoShop in a single non-destructive environment

Limitations

- Localized sharpening more complex than Topaz — requires layers + masks
- Can over-sharpen like Topaz
- Results not as good as other tools in most of my tests – but didn't do local sharpening because of complexity

~\$100 perpetual license (full editor) or ~\$50 for NoNoise standalone

5: Topaz Gigapixel

Simple upscaling



Demo



Upscale

1x **2x** 4x Max Custom

Scale factor 2 x

Dimensions 71.7 MP

W 10368 px H 6912 px

Pixel density 300 PPI

- Select a model**
- Standard
For most images
 - High fidelity**
For high-resolution images
 - Low res
For images with visible pixelation
 - Text & shapes
For documents and strong patterns
 - Art & CG
For artwork and graphics

Image	Original size	Scale	Output size	AI model	Settings
1 image	5184 × 3456 px	2.00x →	10368 × 6912 px	High fidelity	Sharpen 39 Denoise 58 Off

Export to Adobe Lightroom Classic

6: ON1 Resize AI

Part of ON1 RAW, also available standalone



Presets



Browse



Edit



More



Crop



View

Canon Canvas

Canon Matte

Canon Resin Coated

Epson Canvas

Epson Matte

Epson Resin Coated

HP Canvas

HP Matte

HP Resin Coated

Photo Lab

Video

Web & Email

Search Current Photos

None Text Attribute Faces Metadata

None

Nav Levels Info

OM-1
75 mm (OM 40-150mm F2.8)
5/14/2025 8:25:39 AM
5184 x 3456 · 107.5 MB · PSD
Original Photo



ISO 1250 1/640 f/4.5 EV 0

Settings

Standard — Great results for most photos and faster.

Highest Quality — Best results for most photos but not as fast.

Model

Sharpening

Styles



Fix Focus



Screen



Print



More

Sharpening

Type Progressive

Amount 50

Detail 50

Threshold 0

Protect

Face Recovery

Strength 100

Monochrome

Select Faces

Film Grain

Tiling

Demo

Search



Fit

100



28



AI by
Resize



Summary and Recommendations

Which tool, when, and why

Situation influences tool choice

- Quick high volume edits versus longer low volume edits
 - Depends on your workflows and preferences
- Output resolution
 - For lower resolution, like MHWPC or Share the View contests, or social media, less effort is needed than for larger prints, or contests that require full resolution images

Pros and Cons of different tools

- Lightroom AI Denoise AI is very good!
 - For Lightroom users, this is very quick and convenient and good enough in many situations, especially for lower resolution output, unless you need more aggressive sharpening
- DxO PureRAW is outstanding
 - For the very best image quality, highly recommended. It can handle moderate sharpening with appropriate settings. You can use Topaz too if for more aggressive or selective sharpening.
- Topaz is the best option when you need more aggressive sharpening for missed focus or motion blur. Easy to use selective sharpening. Beware of oversharpener.
- ON1 is potentially a more cost competitive alternative to Topaz, but selective sharpening is a lot more complex and in general its results were not as good as the other options
 - It does have good potential as a non-destructive replacement for Lightroom and PhotoShop, but full evaluation of this is beyond the scope here.

General takeaways

- **Don't be afraid to use high ISO**
 - These tools do an excellent job of cleaning up noise
- **There are benefits for small sensors**
 - Micro four-thirds and crop sensors tend to have more noise than full frame sensors, but these AI tools largely make this a non-issue.
 - Upsizing images also factors here, making lower megapixel sensors less of an issue in many cases

Resources

- **Online viewer**
 - pmbatty.github.io/battyphotos
- **Tool Websites**
 - adobe.com/products/photoshop-lightroom-classic.html
 - dxo.com/dxo-pureraw
 - topazlabs.com/topaz-photo
 - on1.com/products/photo-raw
- **DxO Technology Deep Dive**
 - dxo.com/dxo-pureraw/technologies

These slides and all links will be shared after the session.

Questions?

pmbatty.github.io/battyphotos