



The Newsletter of E.J. Peiker - Nature Photographer

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Peridot Mesa in bloom, San Carlos Apache Reservation, AZ (XF-IQ3100, 75-150mm)

The Sonoran Desert in Bloom

In years that it rains regularly, with at least a thorough soaking every other week in the months of November through February, there is a good chance that the Sonoran Desert in southern Arizona and Northern Sonora, Mexico will explode in a carpet of color. If conditions are right, sometime between the end of February and the third week of March, the normally brown desert floor will turn a beautiful shade of green with many colorful wildflowers. This winter, even though it didn't rain at all in November, I was hopeful for a good wildflower bloom since it rained an unusual amount from December through February. While it wasn't a record wildflower year by any stretch of the imagination, it was the best year of the decade so far. It didn't come close to the flower levels of 1998, the best year that anyone can remember, or even as good as 2008 but it was still very good. The bloom peaked a week or two later than it did in those years, presumably due to the lack of rain in November. Unfortunately it got very hot in the middle of March with a week of temperatures in the mid 90's so the best part of the bloom was a bit short lived.

With all of the rain in the winter months, I purposely planned no travel in March in hopes of photographing a good wildflower year and, fortunately, I was rewarded for staying home. The wild flower bloom allowed me to visit many of the south-central Arizona's hot spots for wildflowers and surprisingly, some previous areas of excellence like the Superstition Mountains and Usery Mountain were disappointing while other spots exceeded expectations. This was my first year photographing a wildflower bloom with the Phase One medium format system and this allowed me to use its excellent automatic focus stacking feature which makes it easy to get very deep depth of field as long as there isn't much wind, even with a large 645 sized sensor. I also used the Sony a7R Mk II when I needed to go really wide with lenses like the Voigtlander 12mm f/5.6 and 15mm f/4.5.

In some areas the Mexican Gold Poppy was spectacular, namely Peridot Mesa on the San Carlos Apache Reservation and Bartlett Lake just northeast of the Phoenix Metro, while other places like the White Tank Mountain Preserve had an exceptional Brittlebush (*Encelia*) bloom. There were also some spotty outbreaks of Coulter's Lupine and Globemallow (*Sphaeralcea*). Overall it was a very enjoyable three weeks of photography.



Brittlebush at White Tank Mountain (XF-IQ3100, 40-80mm)

The Best Nature Photographer's Camera...

The following is a slightly updated version of an article I published earlier in the quarter...

"The best camera is the one you have with you" - an old but true cliché... So which camera should you take with you? That is the subject of this article. My readers fall broadly into two primary categories - landscape photographers and wildlife/bird photographers; many also enjoy travel photography. For this article about the best cameras from each manufacturer, I'll include travel photography under landscape and bird photography as a major subset of wildlife photography.

Canon Wildlife - my personal preference for wildlife cameras are APS-C models due to their crop factor which effectively puts more pixels on the subject than full frame cameras. Unfortunately Canon's crop sensor flagship, the EOS 7D Mk II is quite out of date with regard to the sensor. Canon is still using their 2007 process technology based 20 megapixel sensor that does not have on-chip analog to digital converters, nor does it use backside-illumination technology. In combination, this results in about 2 stops less dynamic range and much worse shadow noise than the competition. The EOS 80D, while a consumer camera has a better and newer sensor than the 7D Mk II and is a more modern camera all around but it does not have Canon's best AF system, something that is highly desirable for wildlife photography. These deficiencies eliminate both Canon crop-sensor models from consideration as a best wildlife camera. When we look at full frame models there is the incredible EOS 1Dx Mk II with its 14 frames per second, fantastic AF system but at just 20.2 megapixels on a full frame body. By the time you crop to the same frame as a Canon APS-C body, you are left with just 8 megapixels which is good for 2004 but completely inadequate for most in 2017. That leaves the EOS 5D Mk IV, a much maligned camera due mostly to its seemingly incomprehensible design choices on the video side. As a still camera it is very good, not quite up to the sensor capabilities of a Sony sensor camera, but good for Canon. It incorporates an outstanding AF system and when you crop it to Canon APS C dimensions you are left with 12 megapixels which at least get you to 2008 resolution levels but still well behind the now relatively old EOS 7D Mk II which puts 20 megapixels in the same APS-C area. If Canon were to put the 80D sensor and the 5D Mk IV AF in the EOS 7D line, an EOS 7D Mk III, you could delete this entire section and anoint it the king of Canon wildlife cameras... So which to choose given that an EOS 7D Mk III doesn't exist? If you aren't doing birds in flight, which requires a state of the art AF system, and you don't shoot in the rain, then the 80D is probably the best camera as it incorporates Canon's latest sensor technology with 24 megapixels, the most of any Canon camera either in APS-C or full frame cropped to APS-C dimensions. If you do need great AF and are OK with not having much cropping capability then the EOS 1Dx Mk II is unbeatable. If you can't decide then the EOS 5D Mark IV is your best bet - it is the jack of all trades (except video) camera.



Canon Landscape - the big problem with Canon cameras in general for landscape photographers has been and continues to be a lower dynamic range than any other manufacturer of comparable cameras. The EOS 5DX(R) is the resolution monster of the lineup at 50 megapixels. It is a good camera, although with marginal dynamic range and a weak AF system. If you keep the ISO very close to its base ISO of 100, since it falls off quickly due to noise and poor dynamic range as early as ISO 400, one can record an incredible amount of fine detail. The EOS 5D Mk IV is a better camera from a noise and dynamic range standpoint albeit at a significantly lower 30 megapixel resolution. Personally, as a landscape photographer, I would choose the EOS 5DSR and take a separate exposure for higher dynamic range scenes and

combine the two images in post to get better shadow detail and noise. But the 5D Mark IV, as noted above, is a better compromise camera for all types of shooting. On the travel front, Canon makes it much easier to choose... The new EOS M5/M6 are very good mirrorless camera - the M6 is an M5 without the electronic viewfinder. These cameras are basically a mirrorless EOS 80D and that makes it a very good camera. The Canon lens line-up still leaves a lot to be desired for the EOS-M mount but it is slowly improving although everything seems to be oriented more towards low end consumer grade lenses. You can use full sized EOS lenses with an adapter. My vote for Canon camera of the year for 2016 was the EOS M5, not because it is a ground breaking camera but because it is a very good camera and it finally shows the world that Canon is serious about making a good mirrorless camera; now let's see if they are serious about lenses or if they just see this as a way to usher you into a DSLR if you need something better than lower end consumer glass...

Fujifilm Wildlife and Landscape - The best non medium format Fuji camera for both genres is the Fujifilm X-T2. I have raved before about this camera and its predecessor, the X-T1, for being the most photographer oriented camera on the market with discrete controls for everything without having to go to the menus for anything once you set the camera up to your liking. It also incorporates Fuji's best sensor, the Sony sourced 24 megapixel APS-C sensor. It has a very credible AF system, especially for a mirrorless cameras and has an exceptional line of lenses. It won't rival a DSLR with their huge f/4 super-teles and lightning quick predictive AF systems but it comes as close as any mirrorless camera has and does have lenses out to 400mm which is similar to 600mm on a full frame camera. The Fujifilm X-T2 was my pick for overall camera of the year for 2016, not just for Fuji, but among all manufacturers. Now if only they introduced a model with a Bayer color array rather than an X-Trans one I would be a likely customer. For travel, Fuji now has a downsized version of the X-T2 called the X-T20 - it offers the same image quality but is just scaled back a bit in features in a much smaller body. Alternately the just released X100F, if you are OK with just a single focal length, would be a great travel companion.



For a major step up in image quality for landscape photographers, Fuji just launched the 50 megapixel cropped medium format sensor GFX camera. It has a 44x33mm sensor that has 70% more area than a full frame sensor and 378% more area than Fuji's current APS-C sensor. Currently there are just three lenses and the widest lens is approximately equal to a full frame 25mm lens but a much wider lens has already been announced for later in 2017.

Hasselblad Landscape - There are no real solutions for wildlife photography in the Hasselblad ecosystem. Any of the cameras can be used for animal-scapes but most intimate wildlife photography from a distance is not supported. On the landscape front, the cream of the crop is the near full 645 format H6D coupled with Sony's 100 megapixel sensor. It has only one rival for the ultra high end landscape photography crown in the world and that is the similarly sensored Phase One XF-IQ3100. The H6D is a huge investment but will give you the best image quality available. An alternative, and Hasselblad's best travel camera is the new X1D which is a cropped sensor medium format mirrorless option using the Sony 50 megapixel cropped medium



format sensor. This is a beautifully designed modern camera with the best human user interface I have seen so far - virtually anybody that can use a smart phone can learn to use this camera in minutes. There aren't many lenses yet, no zoom lenses at all, and the widest angle you can currently get is the 30mm lens which is approximately equal to 24mm on a 135 format full frame camera - wide enough for many applications but a bit limiting for the serious landscaper. With an adapter, one can adapt the Hasselblad H lenses which do go wider. AF performance and general speed of operation are the camera's weakest points in its current form but image quality will surpass anything in the 35mm world.

Leica Wildlife and Landscape - lets first put aside any notion of using Leica cameras for wildlife photography. Yes animal-scapes in the wild are no problem for Leica cameras but any serious photography where the animal dominates the photographic frame in a truly wild setting is very unlikely to happen. Leica has neither the lenses nor the camera body performance from either an AF or frame rate standpoint for that type of photography. They simply aren't built for it. For landscape photography, on the other hand, Leica cameras can excel albeit at lower resolution than most other manufacturers. There are three main systems that can be considered; the quasi-medium format Leica S2, the classic Leica M, and the newish Leica SL system. All three are very capable and while I would prefer the larger format 37 megapixel sensed S2 system, the reliability of it, coupled with many reports of very poor service in North America makes it an iffy choice for the serious photographer or professional. The Leica SL on the other hand is a rugged, well made and very capable full frame 24 megapixel system with what is easily the world's best EVF. Currently, the widest lens available is a 24mm which isn't really wide enough for many landscapers but Leica has announced a 16-35mm lens to be available in late 2017. The SL gets my nod as the best Leica for landscape photography currently. For travel, the classic Leica M series still gets my nod and they just recently introduced a new updated M10.



Nikon Wildlife - at the beginning of 2016 I expected the much anticipated D5 to be the best wildlife camera from Nikon in 2016 but two things happened: 1) Nikon surprised us with a D500 APS-C camera that uses the same "world's best" AF system as the D5, and 2) the D5 sensor underperformed on the dynamic range front actually taking a step backward from the D4 at all but very high ISOs. The D500 had some initial teething pains with firmware bugs and strange battery behavior but a lot of that has been resolved. The D500, as stated, sports an incredible AF system that covers the entire frame in a rugged weather sealed body with a 20 megapixel sensor and better dynamic range characteristics at lower ISO than the D5. The D500 is easily Nikon's camera of the year despite getting off to a rocky start. I can honestly say that I have never used a camera with a more responsive and more accurate tracking AF system.



Nikon Landscape - Picking the best Nikon landscape camera is an easy choice. The D810, even 3 years after introduction, is still one of the best full frame 35mm landscape camera on the market. It uses the fantastic

Sony 36 megapixel sensor with enormous dynamic range and incorporates an electronic first curtain shutter that eliminates in camera movement at the time of the exposure. The AF system is now a generation behind but in a landscape camera that isn't important. The D810 is rumored for replacement in 2017 but at this writing there is no better camera in the Nikon line-up for the landscaper even though it is no longer the absolute best 35mm landscape photography camera on the market - that honor is split between Pentax and Sony. On the travel front, look elsewhere! With the cancellation of the Nikon DL cameras this just isn't the brand for a super high quality but highly portable solution.

Olympus Wildlife - I am not a fan of the micro 4/3 sensor for still photographers. I have described my reasons in previous articles and newsletters but it is primarily due to 20 megapixels being severely diffraction limited on this sensor size even at relatively fast apertures. But, I do understand that not everybody needs more than 20 megapixels and that there are some significant size and weight advantages to the m43 system. For wildlife shooters, the answer is pretty easy, the OM-D E-M1 Mk II is the best



m43 camera ever created - by far. It's AF is excellent for a mirrorless camera and it has virtually everything one could want in a true professional grade fast shooting body. It is capable of a staggering 60 frames per second. Couple this camera with the 300mm f/4 which gives you the reach of a 600mm lens on a full frame body and Olympus' 1.4x teleconverter to go all the way out to an 840mm equivalence; all of this in a very small and light package compared to most anything else. One must realize, however, that f/4 will have the depth of field of f/8 on an equivalently framed full frame camera photo so it will be harder to get a buttery smooth background blur.

Olympus Landscape - The biggest challenge, beside the relatively low megapixel count of m43, is the dynamic range that these sensors are capable of delivering. Compared to a full-frame D810 or Sony a7R Mk II, the newest sensor available in the Olympus line of cameras has about 3 stops lower dynamic range! This makes them not as well suited for landscape photography and one can do much better with a similar form factor using cameras from other companies, most notably the Sony a7 and a6xxx series or the Fujifilm X-T2. If I had to choose a landscape kit from Olympus, it would be either the same OM-D E-M1 Mk II or the Pen F. Both use the same sensor so it comes down to your camera style preference. For me I would choose the lighter weight rangefinder style Pen F but with the OM-D E-M1 Mk II one can shoot landscapes and wildlife with the same body, something that you cannot do with the Pen F. The Pen F would also be my choice for an Olympus travel camera.

Panasonic Wildlife and Landscape - I would not choose a Panasonic camera for either landscape or wildlife photography due to some of the same limitations I've previously described for all micro 4/3 sensor cameras. While Panasonic makes excellent m43 cameras, for the most part they are more well suited for videography and are primarily marketed into that space. For wildlife, if I had to choose I would get the just released GH5 as it is the only current action oriented body. The GH5 ups the resolution to 20 megapixels from 16mp on the GH4. On the landscape side, of currently available cameras, the GX8 or the GH5 would be the way to go. The GX8 would also make a very good travel camera. With the recent decision by Panasonic to eliminate their camera division and absorb it into their appliance division, I would be very leery of investing in a Panasonic camera for still photography until we get a better idea of Panasonic's camera business going forward.

Pentax Wildlife - Hands down the best Pentax camera for wildlife is the K3 II. It uses the exceptional Sony 24 megapixel sensor in a full featured 8 frame per second body. Pentax's biggest drawback for this type of shooting is it's autofocus system so it will take some practice and good anticipation to get the most fleeting of subjects. Pentax simply does not have an AF module that approaches anything close to what Canon, Nikon, and Sony offer in their DSLR/DSLT lines. But in the Pentax line, this is the best body for wildlife. Lens selection is also very limited with the longest lens being the 150-450 f/4.5-5.6 lens, a capable performer that gets you full frame equivalency of about 225-675mm - a bit short for some bird work but adequate for most other wildlife.



Pentax Landscape - The Pentax K-1 was one of 2016's most welcome surprises. It is an exceptional body for landscape photography using the same 36 megapixel sensor that made the Nikon D810 famous in a full featured professional body with all the bells and whistles except a world class AF system which is not needed for landscapes. It even incorporates a pixel shift capability that dramatically increases resolution as long as the subject has no movement or relatively little movement. In this mode it moves the sensor so that all colors can be recorded at all pixel locations but this takes time so the subject should be still. Pentax has built some trickery into the body that tries to handle movement but for best results movement needs to be minimal. Alternately, if you are ready for the weight and the investment of a medium format system, Pentax continues to offer its 645Z 50 megapixel cropped sensor medium format camera which utilizes the same sensor as the Hasselblad X1D and Fuji GFX as well as the low end offerings in the Hasselblad H6D and Phase One XF lines. The 645Z will give you the best image quality possible in the Pentax world at a very aggressive price for medium format. On the travel front, there aren't many offerings but Pentax's parent company, Ricoh, makes the highly regarded GR II which is a compact APS-C 18 megapixel camera with a fixed 28mm equivalent lens.

Phase One Landscape - Similar to Hasselblad, for intimate wildlife shooting of distant subjects, the Phase One system really isn't a good wildlife solution although you can use some humongous old manual focus Mamiya lenses on it but at a slow frame rate and with an AF system that is not designed for that kind of photography. That said, some of the very best animal-landscape photographs where animals are a smaller part of the larger landscape that I have seen are taken with Phase One gear. On the Landscape front, there is no higher quality system on Earth at present than the Phase One XF body coupled with the IQ3100 digital back in combination with the Schneider Kreuznach lenses which can go as wide as 28mm (18mm full frame equivalent) and as long as 240mm (160mm full frame equivalent). There are various different resolution digital backs available but the cream of the crop is the 100megapixel Sony sourced sensor digital back. The XF has a number of key options that make it a true landscape photography delight. This includes such things as: 1) an auto-focus-stacking mode that automates the photography process of taking multiple shots at different focus points to enhance depth of field, 2) incorporation of being able to



fine tune and memorize the hyperfocal setting of any lens, 3) the easiest to use time-lapse mode I have ever seen in any camera. On the travel camera front, there is no real choice from Phase One.

Sony Wildlife - While most of the attention on Sony in the last few years has been on their exceptional mirrorless offerings, Sony surprised many, including myself, by introducing an A-mount (original Minolta auto focus mount) high speed full frame camera with what is the most accurate and still very fast AF system ever put into a camera. It uses both a traditional off-sensor fast phase detect AF array similar to what Canon and Nikon use and a much more accurate on sensor phase detect array simultaneously to offer both very fast AF speed and super high accuracy that does not need focus fine tuning for every lens. They coupled this with a back-side illuminated 42 megapixel sensor that can shoot at 12 frames per second with in-body sensor based image stabilization (IBIS). Lens choices aren't as vast as Canon or Nikon but there are excellent 500mm f/4, 70-400, and 300mm f/2.8 lenses along with third party options from Sigma and Tamron. It may be the best camera on the market for those to get high end wildlife and landscape capabilities in a single camera body - nearly EOS 1X Mk II or Nikon D5 speed in a 42 megapixel camera that weighs a lot less...



Sony Landscape - In the Sony world you have your choice of a 42 megapixel SLR type body; the same a99 Mk II covered above, or what has become one of the most popular landscape cameras in the world, the a7R Mk II. My nod goes to the a7R Mk II for a several reasons: 1) it is smaller and weighs less, 2) there is no light robbing translucent mirror which gives it about a 2/3 stop better noise performance, 3) there are now more and better lenses, especially primes, available for full frame E-mount than A-mount due to exceptional offerings from Zeiss, Voigtlander, Tokina, and the new Sony G-master line of lenses. While the a7 series also make excellent travel cameras, especially the Mk II models that incorporate in-body image stabilization (IBIS), my selection here would be the smaller and lighter a6300 or even better the new a6500 which is basically an a6300 with IBIS.

Manufacturer	Best Landscape	Best Travel	Best Wildlife
Canon	EOS 5DSR	EOS M5* or M6	EOS 1Dx Mk II
Fujifilm	X-T2* or GFX	X-T20	X-T2*
Hasselblad	H6D-100	X1D*	N/A
Leica	SL*	M	N/A
Nikon	D810	N/A	D500*
Olympus	Pen F	Pen F	OM-D E-M2*
Panasonic	GX8*	GX8*	GH5 when available
Pentax (Ricoh)	K1* or 645Z	GR II	K3 II
Phase One	XF-IQ3100	N/A	N/A
Sony	Alpha 7R Mk II	Alpha 6500	Alpha 99 Mk II*

* Best new camera of 2016 for each manufacturer

In summary, most of today's camera manufacturers make cameras that are exceptionally well suited for landscape, wildlife photography, or both. Some have better choices than others but in today's digital imaging world, it is easy to find something that excels at your type of photography. We are only limited by

our budget, our imagination, and how much time we have to dedicate to the wonderful world of photography. My personal choices are the Sony a7R Mk II for landscape photography in weight sensitive applications (such as travel on some airlines or significant hiking), Phase One XF with 100 megapixel digital back for no-compromise image quality landscape photography, the Nikon D500 for wildlife photography, and a Sony a6300/a6500 for travel photography. I would have no problem choosing any of the gear in the table above except, personally, I would not chose the Panasonic gear for what I do or Olympus for landscape photography. Your needs, of course, may be different from mine and you can make choices based on your personal circumstances. I've tried to lay out what I think are the currently available best options.

Sigma 500mm f/4 DG OS HSM Sport Lens

The Japanese lens manufacturer Sigma has been around since 1961 and for much of its history it has been known as a company that makes budget lenses for Nikon and Canon cameras (and others at times). In late 2012, Sigma went public with a desire to no longer be seen only as a budget third party lens maker. They came up with the Global Vision line of lenses, new state of the art manufacturing processes and a vastly upgraded quality control process. The Global Vision lenses are part of three different distinct product lines. The Contemporary line stays true to the original Sigma concept - consumer grade lenses made of lighter materials at prices significantly below the camera manufacturer's lenses. The Art line of lenses was conceived to make the finest prime and short zoom lenses, lenses that meet or exceed the very best that the OEM's and even specialty lens companies make regardless of cost. And finally a Sport telephoto line that makes high end long lenses equal in performance to what the likes of Canon and Nikon make. These three lines have become unmitigated success stories and has moved Sigma from the realm of cheap knock-off lens maker to an innovative high end lens maker that produces lenses as good or better than anything on the market. Art lenses are even on par with specialty lens makers like Zeiss and often exceed the image quality of similar Canon and Nikon lenses. As an example, their latest 85mm is considered an equal to the ultra high end Zeiss 85mm Otus lens at a drastically lower cost, and it has autofocus which the Zeiss does not.



On the Sport lens front, Sigma made a huge splash with their 150-600mm Sport lens which I wrote about nearly 2 years ago (<http://www.ejphoto.com/Quack%20PDF/Sigma%20150-600.pdf>). Last year at Photokina they announced the first Sport series prime lens designed to compete with the latest super-telephoto lenses from Canon and Nikon. The new Sigma 500mm f/4 lens is nearly a lightweight as it's Canon and Nikon 500mm siblings, with superb weather sealing, very rugged magnesium alloy construction, and a new AF motor that has 33% more torque resulting in AF acquisition speeds equal to the very best. In the past, despite excellent optics, Sigma lenses have been slower for initial focus acquisition. Both the Canon and Nikon mount versions of the Sigma lens use fully electronic aperture control - while this is not new for Canon it is something new on the Nikon side. It will increase reliability due to no longer needing a spring-loaded mechanical aperture stop down tab in the mount. The mechanical part of Nikon lens aperture control has long been a failure point on Nikon and third party lenses made for Nikon cameras - especially if the lenses that are subjected to a high frequency of lens changes. When first looking at this lens, it is easy to get overwhelmed as it has taken the number of buttons and switches to new levels. There is even a

switch on the lens collar! Among the switches you will find an AF/MF switch, a three position focus limiter switch, an OS mode switch, a custom function switch, a beep on/off switch, an AF function switch, a memory set button to program the 4 lens barrel buttons and a collar detent click on/off switch. Add knobs to loosen or tighten lens collar rotation and another to insert or retract rear element filter and you have a very complex lens. Sigma has gone to the trouble of labeling the switches and buttons in Canonese or Nikonese depending on which lens mount model you buy, therefore, the labels will have somewhat different names if you use a Canon mount or Nikon mount lens keeping consistency with the labeling of lenses by the camera manufacturers. The customization switch allows for three different lens behaviors, one the Sigma standard and two other customizations of AF and OS behaviors. A button activated feature on the new Sigma 500mm f/4 that is not available on Nikon and Canon 500mm lenses is that each of the four lens barrel buttons can be programmed for a different focus distance pre-set. This is extremely useful for bird photographers sitting in a blind with multiple perches. Each button can be programmed for focus on a different perch making it much more likely to obtain AF when moving quickly from one perch to another. The user simply programs the buttons from left to right with the left most button being for the leftmost perch and then programming each button from there as one moves to the rightmost perch. The lens ships with a soft shroud type lens-cap, carbon fiber lens hood and large soft case with backpack shoulder straps. It even leaves room for an attached camera! This is infinitely more useful than the big bulky hard cases that never leave the storage closet after the lens is initially unpacked.



Lesser Goldfinch (D500, Sigma 500mm f/4)

The Sigma 500mm f/4 lens utilizes 16 elements in 11 groups and uses rounded aperture blades for smooth out of focus highlights (bokeh). It uses the most effective Optical Image stabilization in any Sigma to date and has positions for normal use and for panning. It is compatible with the Sigma USB Dock which allows the user to fine tune AF at 4 different AF zone distance settings (compared to just one for Canon and Nikon) and also allows one to fine tune AF speed, acquisition, re-acquisition, stabilization behavior, focus limit range sizes, and update the lens firmware. The new Sigma 500mm f/4 uses a 46mm rear filter which is part of the optical formula and is required for optimal performance. Similar to the other 500mm designs from the

camera manufacturers, a clear filter is included and a polarizer is optional. The front element has a coating that beads off water and resists oil making it very easy to clean. The lens is only compatible with Sigma's TC-1401 1.4x and TC-2001 2x teleconverters which are specifically designed to optimize performance with this lens. It will not work with a Canon or Nikon teleconverter. Despite this world class level of features and construction, the manufacturer's suggested retail price in the USA is \$6000 which is over \$4300 less than the Nikon lens and \$3000 less than the Canon lens at this writing.

I held up this newsletter by a week to make sure I had a chance to fully test the lens as I have had many questions directed toward me about it. If this lens performs, it is a steal (in relative terms). Sigma pre-sales vastly outstripped their ability to manufacture the lens so many are betting on it to be worthy of the Sport moniker. If it does live up to the promise of the Sport lens line, then it could corner the market for 500mm f/4 lenses or at least force some price reductions from Canon and especially Nikon.

Build Quality: Sigma has stepped it up notch with this lens compared to their previous long telephoto offerings! The build quality is every bit as good as the latest Nikon 500mm f/4E lens and actually feels like it might be a bit stronger with more metal which is backed up by the additional half pound of. The days of Sigma making lenses with tripod mounting lens feet that have too much flex seem to be completely a thing of the past. This foot is beefy although a bit on the short side for a 500mm lens but the Sigma replacement foot with integrated Arca Swiss dovetail is much longer and even stronger but does add about 6 more ounces - of course you would be adding that anyway with a third party lens plate. This is the same optional lens foot as is available for the 150-600mm Sport lens - be aware that the dimension of the dovetail is a couple of millimeters narrower than all other Arca Swiss style feet. This can be problematic for lever clamp type of attachments but there is absolutely no problem with the normal knob style quick releases. I find the Jobu replacement foot for the 150-600mm Sport lens to be the perfect foot for this lens - it adds virtually no weight and has the precise dimensions of an Arca Swiss style foot, unlike the Sigma foot.

Size and Weight: A slight drawback of the Sigma 500mm f/4 lens is that it weighs a few ounces more than it's Nikon and Canon competitors although it is a bit lighter than the insanely overpriced Sony 500mm f/4 lens. Overall physical size of the lens is similar enough to the competition that it isn't even worth mentioning.

Image Stabilization: Sigma calls their stabilization system by the moniker of OS for Optical Stabilization. The nice thing about Sigma Sport lenses is that you can customize how the OS system reacts with the Sigma Dock and its lens tuning software - an additional option that I recommend for anyone owning high end Sigma lenses. The lens offers three OS modes:

- Dynamic View Mode – This is a very aggressive mode that feels a bit overly aggressive similar to very old IS systems where the image in the viewfinder can really jump around (similar to the original Canon 300mm f/4 IS lens)
- Standard – This is the default setting. According to Sigma, the OS effect is well-balanced and suitable for various scenes.
- Moderate View Mode – This mode offers an excellent compensation of camera shake and achieves very smooth transition of the image in the viewfinder.

After experimenting quite a bit and doing some online research as well as communicating with other early adopters of this lens, I have found that customizing the OS system with a setting of Moderate View Mode gives good performance for Wildlife and Sports photography without creating a jumpy viewfinder - note that this is not the default setting that the lens ships with. With this customization, I find that the Sigma 500mm lens behaves very much like the Nikon 500mm f/4E lens or the Canon 500mm f/4L II lens and I can hand hold the lens and shoot at least 3 stops slower than I could with OS off. Even though Sigma has always said to turn OS off on a tripod, they also state that it is simply to reduce battery consumption. They have always been vague about whether or not there is any other detriment, I find that the lens behaves similar to

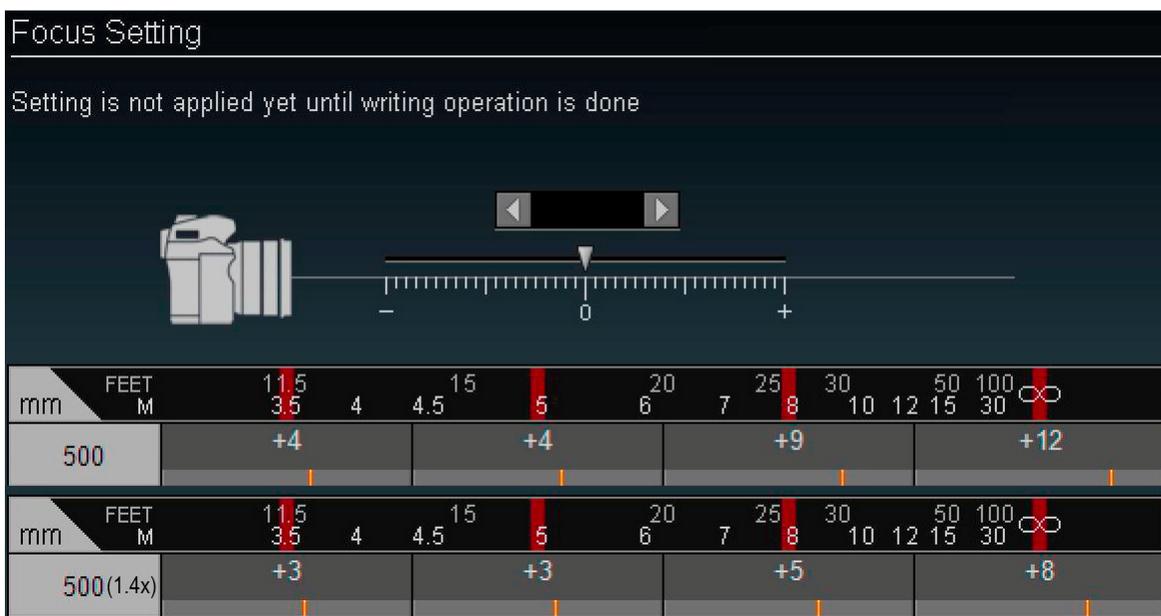
Nikon VR lenses - namely that if your shutter speed starts to get up towards 1/1000 second, you will get slightly better resolution if you turn OS off but it is really minimal and it requires some pixel peeping to really see any difference. If you do forget to turn it off when it's bright out, it really isn't a big deal. Similar to Canon and Nikon, Sigma says you should turn off the OS prior to a lens change even though few people actually ever do that!



Rock Squirrel (D500, Sigma 500mm f/4)

Auto-focus: Most people really only care about three things when it comes to super-teles - does it have world class AF, is it sharp and what is its weight? Lets tackle the AF question first! Once I customized the internal AF settings to Fast AF Priority for Custom Switch Setting 1 with the Sigma Dock, I found this lens to be the fastest focusing 500mm lens I have used. In repeated tries, I saw an ever so slightly faster initial acquisition, especially when the lens is focusing from very far to very near. The cost of using Fast priority, according to Sigma, is that there may be a slight decrease in first shot focus accuracy but in all honesty, I did not experience this in my use of the lens so far. In Standard AF mode the difference to the Nikon and Canon 500mm f/4 lenses is too small to notice but there might be a very slight edge to the Nikon lens over the Canon and Sigma, I would call it a near tie. There is also a Smooth AF Priority setting that can be assigned to a Custom switch setting which provides for smoother focus transitions and is designed primarily for video shooting. I see virtually no difference in focus tracking after acquisition between the lenses in normal or fast AF mode using a D500 with its fantastic focusing system. This is the first third party long lens I have used where I can say without reservation that the AF is as good as the OEM lenses that cost much more. There is a focus accuracy caveat though! In my opinion, based on extensive testing and focus calibration of hundreds of Sigma lenses over the years, no Sigma lens should ever be used on any camera without at minimum an in-body focus calibration using the Canon Micro-adjust feature or the Nikon AF Fine Tune feature and ideally using the optional Sigma Dock to finely tune the lens to the body. All Sigma lenses require some calibration to the body. Most Nikon users are no stranger to this because virtually no Nikon

lens is at its sharpest without some AF Fine Tune but in the Canon world, if you own one of the bodies and lenses introduced in the last 5 years, there is at least a 50/50 chance that the camera/lens combination you are shooting with will be very near its sharpest even without adjustment; however, you still can't customize the AF for different focus distances with either the Canon or Nikon lenses. Even though there is a more involved procedure to focus tune a Sigma lens with the dock, it also will end up being more accurate through the entire focus range rather than just at the single distance you used to do your focus tuning. Below is the focus fine tuning table for the Sigma 500 f/4 lens that I used for this review - note that this is only for illustrative purposes and that your lens will have different values and these. They are only valid on my camera/lens combination. You can see that one is able to enter different focus offsets for different shooting distances and the lens then interpolates for in-between distances - this is not possible on Canon and Nikon lenses:



One thing that I noticed while doing the lens calibrations is that this lens exhibits more focus shift than is normal for a lens like this. Focus shift is a phenomenon where the focus point shifts when the aperture is changed. This phenomenon is prevalent in very fast primes like 35mm f/1.4 lenses but it is not usually even measurable in super-telephoto lenses. Since the lens is always at f/4 during AF operations, focus shift could cause slightly out of focus shots if you shot at anything other than f/4. I found that there is a 2-3 point lens calibration offset at virtually all shooting distances between f/4 and smaller apertures. Unless you plan on always shooting this lens wide open at f/4, I would recommend doing the focus calibration at f/5.6. A message for Sigma: If you are going to build lenses with focus shift and provide a USB dock solution to calibrating lenses, then give us the opportunity to also calibrate focus at different apertures! While this would vastly increase the focus calibration complexity, Sigma could make it an optional mode for advanced users that would allow us to dial in any Sigma lens with an extreme level of precision for all distances and apertures. As you can see from the graphic above, minimum focus distance on this lens is the best in class at just 11.5 feet, about a foot closer than you can get to your subject than with the best selling lens in the category, the Canon 500mm f/4L II. Focus breathing (the reduction in actual focal length as the lens is focused to minimum focus distance) is well controlled and on par with the others resulting in a magnification ratio of about 1:6.5.

Image Quality: There are a number of things that define image quality including Sharpness, distortion, chromatic aberration, and bokeh. I tested the lens both in the field and on test charts. For sharpness, the

lens outresolved the sensors of the Nikon cameras that I tested it on which includes the D7200 which has the smallest pixel pitch of any Nikon camera on the market and therefore would be the most likely to show any problems within the DX (APS-C) crop of the lens' image circle. The lens outresolved the sensor even at f/4. I then attached the Sony a7R Mk II with a 42 megapixel sensor via a Novoflex adapter to measure corner resolution. Again the lens outresolved the sensor since it reproduced the 4000 line per inch portion of the ISO 12233 test chart which is the highest that my chart goes. In fact, at f/4 this is tied with the Canon as the sharpest 500mm lens I have tested at moderate and long shooting. Visual sharpness improved at f/5.6 where all of the current crop of 500mm lenses are equal. This is the first 500mm lens that I would have little reservation mounting on a Nikon body and shooting it wide open if necessary and most certainly having zero reservations stopped down one stop to f/5.6. The sharpness/resolution conclusion then is that the lens outresolves any sensor on the market and is approximately on par with the Canon or Nikon 500mm f/4 lenses. One thing I did notice though is that both the Nikon and Canon lenses have somewhat higher contrast - not something that would matter much to me since I shoot 100% in RAW which requires processing of the files anyway. Next I tested linear distortion. Super teles rarely have notable linear distortion and in most cases, since these lenses aren't used to shoot architecture, it generally would never be noticed even if there was significant distortion. The lens had virtually no linear distortion as expected. Chromatic aberration (CA) can be a problem with color fringing on very high contrast edges especially in the corners. Of the three lenses, the Canon 500mm f/4L II has essentially zero CA throughout the frame. Both the Nikon and Sigma have a very slight amount of CA that is almost too small to see and it is inconsequential. Finally on the subject of out of focus highlights, or bokeh, the Sigma's nearly perfectly round aperture produces absolutely beautiful out of focus highlights without the scalloping, or bageling as some call it, which has always been the only real weakness of Canon super teles. One area that the Sigma is a bit weaker in than it's more expensive 500mm competitors is in corner light roll-off (sometimes referred to as vignetting). On a full frame sensor at f/4 the Sigma displays about a half stop more of this than the others, by f/5.6 it is similar to the Canon and Nikon lenses and by f/8 it is gone. As this lens gets added to RAW conversion software databases, this will be automatically corrected and if you are shooting with an APS-C camera like a Nikon D500, you will never see this at all even without software correction.

Finally, I put the lens to the test with the Sigma TC-1401 1.4x teleconverter. Performance was very similar to the Nikon 500mm with the latest TC-14E III for focus and sharpness. A slight increase in chromatic aberration is present with the 1.4x converter. I do not recommend shooting this lens (or any lens for that matter) with a teleconverter wide open. Stopping down 2/3 to 1 stop to f/7.1 or f/8 optimizes sharpness. Canon, as has always been the case, does have slightly higher acuity, especially wide open with its latest 1.4x teleconverter, but the difference isn't as big as it used to be in years past. AF performance with the 1.4x, while degraded somewhat was still excellent and on par with the Canon and Nikon lenses and their respective teleconverters. Surprisingly, the focus shift noticed on the lens without a teleconverter is reduced with the TC-1401 teleconverter attached. I did not test the Sigma TC-2001 2x converter as I have never found 2x teleconverter images satisfactory on modern high resolution sensors and generally do not recommend them.

Below is a comparison table of the four 500mm f/4 lenses currently on the market. It is important to note that, in real world, performance between all of these lenses is essentially equal. Even though one lens may be ranked above another in the table, these are largely derived from test charts utilizing a single sample of the lens - actual photos taken will be essentially identical and are more heavily influenced by the sensor of the camera that is attached than they are of the lens since these lenses outresolve any sensor you can attach to them.

	Canon 500 f/4L II	Nikon 500 f/4E	Sigma 500 f/4	Sony 500 f/4
Minimum focus (MFD-ft)	12.4	11.9	11.5	13.1
F/range	4-32	4-22	4-32	4-32
Mag	0.15x	0.14x	0.15x	0.135x
Blades	9	9	9	9
Filter (mm)	52	40.5	46	42
Dimensions (in)	5.75x15.1	5.5x15.25	5.7x14.97	5.5x14.5
Weight (lb)	7.03	6.81	7.3	7.6
Price (USD)	\$9000.00	\$10300.00	\$6000.00	\$13000.00
500mm				
MFD sharpness (rank)*	1	2	3	n/a
10M sharpness (rank)*	1	3	2	n/a
Infinity sharpness (rank)	1	3	2	n/a
Chromatic Aberration*	1	2	3	n/a
Contrast	2	1	3	n/a
Bokeh	3	2	1	n/a
Vignetting	2	1	3	n/a
Focus acquisition*	3	2	1	n/a
Focus accuracy/tracking*	2	1	2	
500mm+1.4x				
MFD sharpness (rank)	1	2	2	n/a
10M sharpness (rank)	1	2	2	n/a
Infinity sharpness (rank)	1	3	2	n/a
Chromatic Aberration*	2	1	3	n/a
Contrast	1	3	2	n/a
Bokeh	3	2	1	n/a
* Differences negligible				

In closing, several people have asked me to compare this lens vs. the very good Sigma 150-600 Sport. I look at the two as completely different lenses for different needs. Clearly the zoom lens wins on the versatility front by virtue of being a variable focal length lens and it can deliver outstanding results, especially when finely tuned across the zoom and focus distance range with the Sigma dock. The 500mm f/4 is, however, 1 1/3 stops brighter. The 500mm prime lens is also measurably sharper and can be extended to 750mm with the 1.4x TC-1401 and still be a faster lens (f/5.6) than the 150-600 is at 500 or 600mm (f/6.3). I would not recommend adding a TC to the 150-600mm zoom lens but I have no reservations to do so on the 500mm. Weight and size wise the zoom has an advantage although on the weight front that difference is only about a pound, however, the size difference is substantial. Usability of the 500mm lens on a gimbal head is a bit better as the center of gravity of the lens does not shift. The 150-600 on a gimbal can be tougher to handle due the shifting center of gravity as you zoom making it more likely to have lens flop. The extra 1 1/3 stop of light that the lens lets in makes it much easier to find your subject in low light. On a recent trip to Ecuador, we spent two mornings photographing the very reclusive Chestnut-crowned Antpitta which lives deep in dark brush. Even though the bird was visible to the plain eye, I could barely see it in the dark viewfinder of an f/6.3 lens. Those with f/4 super-teles had no problem finding the bird. On the second day I actually used the f/2.8 70-200mm lens and got much closer just so that I could see and compose the bird in the viewfinder. Additionally, focus speed is simply faster when the camera's AF system is getting nearly 3 times more light. Add to that a new AF motor with 33% more torque and you have significantly faster AF performance with the 500mm f/4 Sport lens. So in the end, for convenience with excellent results, the Sigma 150-600 Sport is still a personal favorite but when fast AF in low light or a longer focal length is needed, the 500mm (with the TC-1401) is highly desirable.

The 500mm f/4 lenses represents some of the very finest telephoto glass on the planet and all of the lenses are more than capable of outperforming virtually any photographer on the planet. I have to highly recommend the Sigma 500 f/4 DG OS HSM lens given that it is dramatically less expensive while giving up virtually nothing on performance and adding customization features that the others don't have. It maintains the super high end build quality that we expect from lenses in this class. I see very little reason to buy the camera manufacturer's lenses unless a half pound is worth three or four thousand dollars to you!

The Very Best Zoom... (Nikon AF-S 70-200 f/2.8E Review)

In October 2016, Nikon introduced the new AF-S 70-200mm f/2.8E FL VR lens that attempted to address some of the shortcomings of its predecessor. The older 70-200 f/2.8G, while a very sharp fast focusing lens suffered from extreme focus breathing - this is a phenomenon where a lens significantly reduces its focal length as you focus toward its minimum focus distance. The older lens was just a 135mm lens at minimum focus and didn't reach the full 200mm focal length until focused 50 feet out or more. The other shortcoming of the 70-200G, especially among photographers that make a lot of lens changes, was reliability of the mechanical aperture control tab. When the spring that controls that tab snapped, the lens would go to f/2.8 with no way of changing the aperture even though in camera, you would get indications of the desired aperture when it was set to something other than f/2.8. This happened to me several times over the years with Nikon's electro/mechanical aperture design. By completely redesigning the optics of the 70-200 f/2.8E and going to a fully electronic aperture diaphragm, these problems were resolved. On top of



reliability of the mechanical aperture control tab. When the spring that controls that tab snapped, the lens would go to f/2.8 with no way of changing the aperture even though in camera, you would get indications of the desired aperture when it was set to something other than f/2.8. This happened to me several times over the years with Nikon's electro/mechanical aperture design. By completely redesigning the optics of the 70-200 f/2.8E and going to a fully electronic aperture diaphragm, these problems were resolved. On top of

that, Nikon threw in new fluoride coatings, closer minimum focus, a more advanced vibration reduction system, and trimmed the weight slightly. On paper, the lens sure seemed like a winner...

In February, I traveled with NatureScapes to Ecuador for a bird photography workshop which had a significant emphasis on multi-flash hummingbird photography. My lens of choice for this sort of thing has always been the 70-200 f/2.8 lenses, due to their exceptional sharpness and super fast autofocus, coupled with the best APS-C body that money can buy. So I rented the new 70-200 f/2.8E lens from LensRentals.com in Tennessee and coupled it with a new Nikon D500. Before leaving home I precisely calibrated focus and off I went to Ecuador. I was definitely not disappointed in the image quality - this lens is just insanely good - by far the best 70-200 I have used and that includes the highly rated Canon EF 70-200 f/2.8L Mk II. Many online lab reviews also rate the lens higher than the Canon although in the real world, they are both so good that either will not disappoint. The slightly lighter weight is also welcome. For image quality, it is the very best zoom lens made from my perspective.

There are some things I don't like about the lens. First, the new lens foot has a button release and thumb screw to allow you to remove the foot. If the thumbscrew is not totally tight, picking up the lens by the lens foot can inadvertently allow you to push the release button and cause it to release dropping the lens on the ground - always tighten the thumbscrew!!! Second, Nikon reversed the position of the zoom and focus rings on this lens compared to previous models. This alone isn't a huge problem as you quickly get used to it but the problem is that it is virtually impossible for anyone with larger than child hands to turn the zoom ring with the camera up to your eye without also turning the focus ring which can cause you to override your focus setting. Since this isn't a parfocal lens (same focus at every zoom setting) one should also refocus anyway after zooming but it is a bit disconcerting to adjust the zoom level slightly suddenly see the image go completely out of focus. The last item that I don't like is the price. Nikon has priced this as the most expensive 70-200 f/2.8 ever offered at \$2800. By comparison, the excellent Canon 70-200 f/2.8 II is under \$2000 and Tamron just introduced a new professional grade 70-200 priced at \$1300. Some very early testing shows that it may outperform the Canon EF 70-200 f/2.8L II for resolution but it reportedly has massive focus breathing. For now, the new Nikon AF-S 70-200mm f/2.8E FL VR is the king of all zooms but at a very steep price.



Velvet-purple Coronet - Ecuador (D500, 70-200mm)



Booted Racket-tail, Ecuador (D500, 70-200mm)

DuckShop 2017 Report

The 2017 Arizona DuckShop concluded successfully in late February. We had a great group of 5 participants plus myself and we visited some of the East Valley of the Phoenix Metro best wintering grounds from a photographic perspective. Most of the usual ducks were present including American Wigeon, Ring-necked Duck, Mallard, Mexican Duck, Lesser Scaup, Ruddy Duck, Northern Shoveler, Green-winged Teal, and Cinnamon Teal. Missing this year, curiously, was Northern Pintail, Gadwall and Hooded Merganser but instead we were treated to a cooperative Western Grebe and a Pied-billed Grebe that posed in the best water for several minutes. We even had a Rosy-faced Lovebird make an appearance. The weather and light was great with temperatures in the low 50's in the AM and mid to upper 70's in the afternoon, a great break from the cold winter for those that traveled from the north and east. The 2018 DuckShop is now open for enrollment: <https://www.naturescapes.net/workshops/duck-waterfowl-photography-workshop-2018>



Pied-billed Grebe (D500, 150-600mm)

The Best Lenses For Your Nikon DSLR, Canon DSLR, and Sony (FE) Cameras

I am very fortunate to get to try a lot of gear and from this I keep the table below of the best lenses for the Canon EF, Nikon F and Sony FE mount systems up to date and include the latest version in every newsletter. There are of course other great lenses but these are the best of the best. A trend over the last couple of years, with the increasing ascension of Zeiss and the Sigma Art and Sports lines, is the slow disappearance of Canon and especially Nikon lenses from the best lenses available list. The OEM's still dominate in the super-telephoto arena but in the wide to standard arena, they are getting beaten handily. A few changes were made this quarter with the addition of the new Sigma 500mm f/4 and the Nikon 70-200mm f/2.8E. I have also added 2 new categories - Full-frame Fisheye which covers lenses designed to give you a full frame 180 degree corner to corner view and a new wide angle category called Hyper Wide - these are the widest quality options available for the three mounts without resorting to Fisheye lenses

Lens Category	Canon EF Mount	Nikon F Mount	Sony (F)E Mount
Full-frame Fisheye	Canon 8-15mm f/4L Sigma 15mm f/2.8	Sigma 15mm f/2.8	N/A
Hyper Wide	Canon 11-24mm f/4L	N/A	Voigtländer 12mm f/5.6 Voigtländer 10mm f/5.6
Ultra Wide Prime	Zeiss 15mm f/2.8 ZE Canon TS-E 17mm f/4	Zeiss 15mm f/2.8 ZF.2 Nikon 19mm f/4 PC	Zeiss Batis 18mm f/2.8 Voigtländer 15mm f/4.5
Extra Wide Prime	Zeiss Milvus 21mm f/2.8 Sigma 20mm f/1.4	Zeiss Milvus 21mm f/2.8 Sigma 20mm f/1.4	Zeiss Loxia 21mm f/2.8 Tokina Firin 20mm f/2
Standard Wide Prime	Zeiss Otus 28mm f/1.4 Zeiss Milvus 25mm f/2 Sigma 24mm f/1.4 Art	Zeiss Otus 28mm f/1.4 Zeiss Milvus 25mm f/2 Sigma 24mm f/1.4 Art	Zeiss Batis 2/25 Sony 28mm f/2
Moderate Wide Prime	Sigma 35mm f/1.4 Canon 35mm f/1.4L II	Sigma 35mm f/1.4 Zeiss Milvus 35mm f/2	Sony-Zeiss 35mm f/1.4 Zeiss Loxia 2/35
Standard Prime	Zeiss 55mm f/1.4 Otus Sigma 50mm f/1.4 DG Art	Zeiss 55mm f/1.4 Otus Sigma 50mm f/1.4 DG Art	Sony-Zeiss 55mm f/1.8 Zeiss Loxia 2/50
Portrait Prime (short	Zeiss 85mm f/1.4 Otus	Zeiss 85mm f/1.4 Otus	Sony 85mm f/1.4 GM

telephoto)	Canon 85mm f/1.2L II	Nikon 105mm f/1.4E	Zeiss Batis 1.8/85
Medium Telephoto Prime	Zeiss 135mm f/2 Apo Sonnar ZE Canon 135mm f/2L	Zeiss 135mm f/2 Apo Sonnar ZF.2 Sigma 150mm f/2.8 Macro OS	N/A
200mm Prime	Canon 200mm f/2L Canon 200mm f/2.8L II	Nikon 200mm f/2G Nikon Micro Nikkor 200mm f/4ED	N/A
300mm Prime	Canon 300mm f/2.8L IS II	Nikon 300mm f/2.8G VR Nikon 300mm f/4 PF	N/A
400mm Prime	Canon 400mm f/2.8L IS II Canon 400mm f/4 DO II	Nikon 400mm f/2.8E VR	N/A
500mm Prime	Canon 500mm f/4L IS II Sigma 500mm f/4 DG OS HSM	Nikon 500mm f/4E VR Sigma 500mm f/4 DG OS HSM	N/A
600mm Prime	Canon 600mm f/4L IS II	Nikon 600mm f/4E VR	N/A
800mm Prime	Canon 800mm f/5.6L IS Sigma 800mm f/5.6APO DG	Nikon 800mm f/5.6E VR Sigma 800mm f/5.6APO DG	N/A
Wide Angle Zoom	Canon 11-24mm f/4L Canon 16-35mm f/4L IS	Nikon 14-24mm f/2.8G Tamron 15-30mm f/2.8 Di VC	Sony-Zeiss 16-35 f/4
Standard Zoom	Canon 24-70mm f/2.8L II Tamron 24-70mm f/2.8 Di VC	Tamron 24-70mm f/2.8 Di VC Nikon 24-70mm f/2.8E ED VR	Sony 24-70 f/2.8 GM
Telephoto Zoom	Canon 70-200mm f/2.8L IS II Canon 70-200mm f/4L IS	Nikon 70-200mm f/2.8E FL VR Nikon 70-200mm f/4G VR	Sony 70-200 f/2.8 GM Sony 70-200 f/4 G Sony 70-300 f/4.5-5.6 G
Super Telephoto Zoom	Canon 200-400mm f/4L 1.4x Ext Canon 100-400 f/4.5-5.6 II	Sigma 150-600 f/4.5-6.3 Sport Nikon 200-500 f/5.6 VR	N/A
Macro	Sigma 150mm f/2.8 Macro OS	Nikon Micro Nikkor 200mm f/4	Sony 90mm f/2.8 Macro

Workshops

All of my group workshops are run through NatureScapes Certified Workshops. Please check out all of the great offerings from NSN here: <https://www.naturescapes.net/workshops/>

Private instruction in landscape and wildlife photography are also available as well as image processing training. To learn more click here: http://www.ejphoto.com/duckshop_private.htm

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Newsletter Info

This is the 16th year of my quarterly Newsletter. I try to cover the wide array of digital imaging and products from mirrorless to medium format and everything in between. Throughout the years, the information contained herein has always been free and will continue to be free despite the many hours it takes to put it together and significant equipment and travel expenses. Most of the products I have tested and reviewed, I have purchased myself; some have been made available to me for review and evaluation by loyal readers and a few have also been made available to me by the manufacturers themselves. While the newsletter is free either via eMail subscription or via accessing it on my website at

<http://www.ejphoto.com/newsletter.htm>, if you find the information useful to you and you do wish to donate for my continuing efforts, you may do so via PayPal and sending the funds to ejpeiker@cox.net.

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Sonoran Desert in Bloom (Sony a7R Mk II, Zeiss Batis 25mm)

E.J. Peiker

E.J. Peiker - Nature Photographer