

Telephoto Lens Choices for all Budgets

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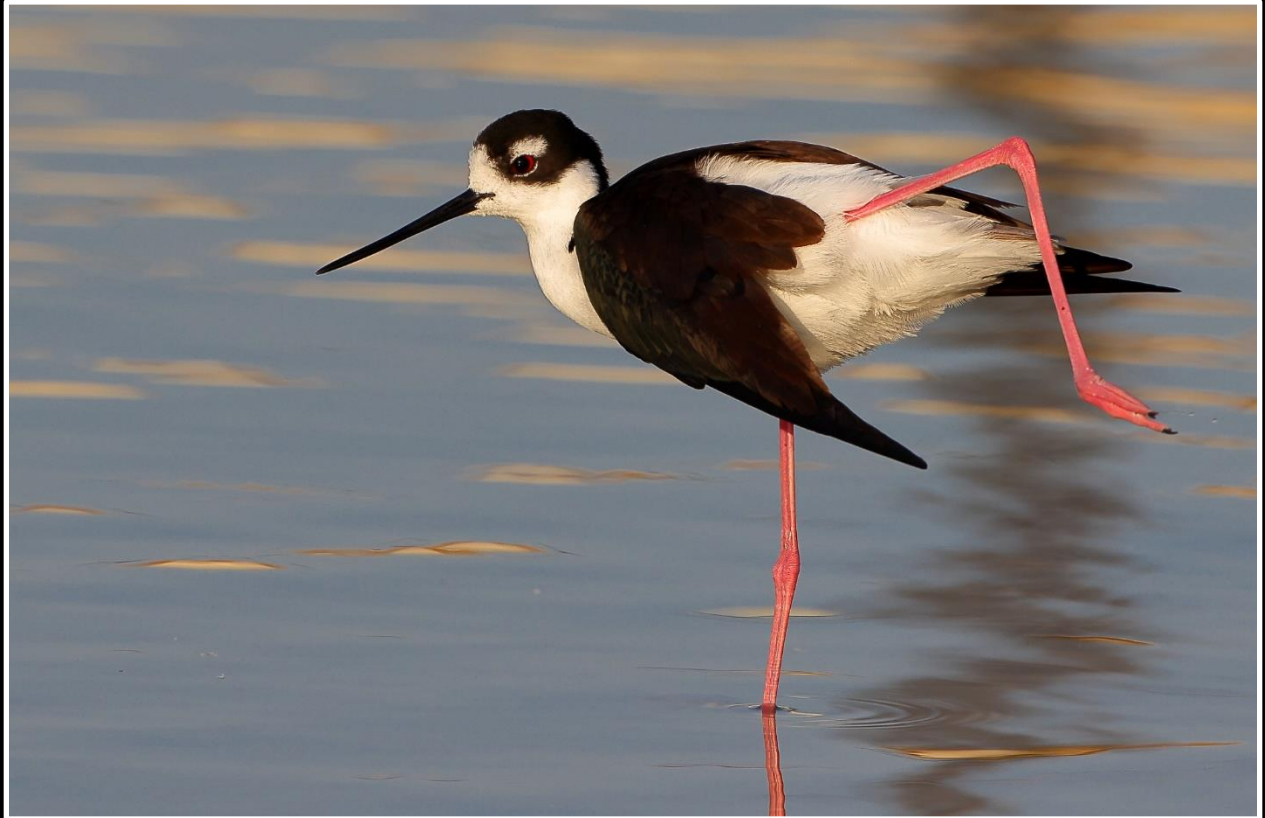


Figure 1 A black-necked stilt stretches in Bannworth Park - a city park pond in downtown Mission, TX. The park has lots of human visitors, so birds frequenting the pond are fairly relaxed around photographers. Still, it helps to be farther away from them. I maintained my distance by using a Canon 600mm f/4 lens on a tripod with a Wimberley gimbal head. To fill the viewfinder with this bird, I set the Canon R5 mirrorless camera to the 1.6x crop mode. That essentially gave me a focal length of 960mm. Though the lens remains a 600mm, the angle of view is that of a 960mm lens and I can stay farther away from my subject. And the bird is larger in my viewfinder making it easier to see if the eye is open and if it is looking a little in my direction. I tend to avoid shooting photos of birds looking away from me. Being able to see the subject well in my viewfinder helps me know when to shoot.

When I first began nature photography in 1972, my long lens was a Canon 300mm f4. That was all I could afford then. But I still did quite well by finding ways to get close to wildlife and used self-made photo blinds at my backyard bird feeder frequently. I also visited many parks where wildlife was habituated to people around them.

Long prime professional lenses cost plenty today. I use the Canon 600mm f/4 III telephoto lens a lot in my floating blind. I still wonder if I am foolish to use a lens, especially in the wetlands, which cost more than three times the price of the brand-new pickup truck I bought in 1977. The lens cost about \$13,000. Being the latest version, it is sharper and lighter than previous 600mm models, and when coupled with Canon's latest 1.4x teleconverter, it reliably produces sharp images at 840mm! How much bigger an 840mm lens makes your subject in the image is amazing.

Of course, this premium lens is not for everyone. Most shutterbugs pass on it for the high price tag alone, but the size of the lens and weight make it unappealing to many even when price is not a limiting factor. It is a prime lens built with the best optical glass and that produces exceptional quality, though. But a drawback to all prime lenses is you are stuck with the focal length it is or with an even longer focal length if you add a teleconverter to the optical path. Sometimes you must change the focal length quickly to suit the situation and that is not possible with a prime lens. That is why a zoom lens often works best for wildlife. If you cannot easily change your photo distance – such as when in a photo blind or shooting from a vehicle – a zoom lens is the answer.

Camera companies build these super telephoto prime lenses because professional photographers and serious hobbyist demand them. Typical focal lengths are 500mm, 600mm, and some 800mm lenses are available. I have also owned the Canon 800mm f/5.6 telephoto lens and it was superb. But I sold it ten years later to get the new Canon 600mm f/4 III. Why drop down in focal length you wonder? I like combining the new Canon 600mm f/4 III lens with the new 1.4x teleconverter and that produces an 840mm f/5.6 lens that focus closer than the 800mm f/5.6 by itself and close focusing is important for small birds and mammals. Plus, 840mm provides a little more magnification than the 800mm lens.



Figure 2 The black-bellied whistling duck kept its eye on me most of the time. Using the Canon R5 with the wonderful Canon 100-500mm f/7.1 lens, I used 1/400 second and f/10 with a + 2/3-stop exposure compensation. The auto ISO selected ISO 400.

And speaking of teleconverters, these are quite useful and worth getting at least the 1.4x tele for most photographers. They are especially good on prime lenses (aka: fixed focal length lenses). A teleconverter is an optical device that inserts between the lens and the camera. The two most common powers are 1.4x and 2x and Nikon offers a 1.7x.

Here is what they do:

Teleconverter	600mm f/4 prime lens example
1.4x	840mm f/5.6
2x	1200mm f/8

Notice the 1.4x teleconverter does not offer the focal length of the 2x, but the 1.4x still doubles the size of the subject. The 2x teleconverter doubles the height and the width of the subject and that is a quadruple in subject size. Both teleconverters cost light. The 1.4x slows the lens 1 stop and it becomes an f/5.6 in this example and the 2x teleconverter cost two stops of light so it is an f/8 lens. That means you cannot open the lens any more than the new slower maximum aperture. Lens speed is important when you must photograph on dark cloudy days or in any other low light situation. Also, autofocus tends to be faster and more accurate if the lens passes more light. For these reasons, pro photographers tend to use faster lenses. Fortunately, with the better autofocus offered by new digital cameras along with better high ISOs to use, the lens speed advantages have diminished and that makes slower but more affordable and lighter lenses worth considering.

Here is a list of super telephotos lenses you can select today and there are many more not listed. If you want to spend lots of money, these lenses will do it for you. Do you need them?

The **Big** Money Lenses

1. AF-S NIKKOR 500mm f/4 \$10297
2. AF-S NIKKOR 600mm f/4 \$12297
3. AF-S NIKKOR 800mm f/5.6E FL ED VR \$16297
4. Canon 500mm f/4 \$9000
5. Canon 600mm f/4 III \$13000
6. Canon 800mm f/5.6 \$17000

More Affordable Lenses

7. Nikon 500mm f/5.6 \$3297
8. Nikon 200-500mm f/5.6 \$1056
9. Sony FE 200-600mm f/5.6-6.3 \$1998
10. Sigma 150-600mm f/5-6.3 \$900
11. Tamron 150-600mm f/5-6.3 \$1300
12. Canon RF 100-500mm f/7.1 \$2750
13. Canon 600mm f/11 \$800
14. Canon RF 800mm f/11 IS STM \$1000

Notice the big prime telephotos lenses with large maximum apertures of f/4 or f/5.6 are the most expensive. They are built for pros who are rough with them. They are solid lenses built tough to take a beating from the pros and wealthy amateurs who generally buy them. Their optical quality is superb, but their price is high. Pros buy them for what they can offer in their highly competitive field, and they are all a tax write-off that somewhat makes the lens less expensive when you consider the tax angle.



Figure 3 Anytime I photograph an animal in the snow, I always use full manual exposure. A shutter speed of 1/500 second with f/6.3 and ISO 1000 properly exposes the scene. There is not much detail in the fresh snow, but then the diffused light on the snow prevents any shadows from occurring, so no detail as the snow is all the same brightness.

As for me, I use top-of-the line lenses to help me produce the highest quality images I can in my nature photography field. It paid off for me over the decades with abundant photo sales that continue to provide me with a comfortable living. Though I still write about photography and teach many photography workshops, I do it because I really enjoy doing that and could easily retire, but I enjoy teaching photography so much that I will likely teach photography for as long as I can.

Today, with the new mirrorless cameras, need for the big super telephotos is becoming less rather rapidly. And that is a good thing because as I rapidly approach 70, I know there will be a time when lighter equipment is not only desirable, but totally necessary if I am to keep photographing.

Let us be clear. If you wish to photograph wildlife easily and well, you usually need a long lens with lots of reach. But even a 70-300mm lens works fine for wildlife that are habituated to humans and therefore easy to approach. An example of this is the many city park ponds frequented by waterfowl, especially if humans feed them. Often they get so used to people that you can get within a few feet of them without alarming the birds. Some will eat out of your hand.

Most wild animals have learned to keep their distance from us. Even in national parks, most animals will move away from you if you approach too closely, and parks have rules that forbid you to approach closer than a set distance. In Yellowstone National Park, it is against the rules to approach any animal within 25 yards, and you must stay 100 yards away from wolves and bears. These how-close-can-you-approach rules vary from park to park.



Figure 4 The American white pelican soared past me while I was stalking ducks in my wonderful floating blind. I used manual exposure set to 1/1250 second with ISO 1000 and f/8. The lens was the Canon 600mm f/4 with a 1.4x teleconverter making it 840mm. How to you manually set exposure for a bird suddenly appearing in flight? Easy. I knew the white pelicans would fly down the lake toward me to land in a favorite bay. I set my exposure to produce the first blinkies in the white feathers of a pelican already floating on the water in the nearby bay and used that for the ones flying in to join the other pelicans.

What lens do you select?

The difference in image quality between the most expensive telephoto lenses and third-party lenses that are much less costly is less than it was years ago. All lenses are better today. Unless you have superb photo technique and are willing to use that technique, I doubt you will see much difference

between expensive lenses and those that are less costly. And even if there is a slight difference in image quality between a \$10000 lens and a \$2000 lens, any flaws in your technique negate that difference. And if you are interested in what makes up super wildlife photo techniques, read my article on my website at www.gerlachnaturephoto.com Go to the home page, scroll down the page past all of the photo workshop listings, and you will find several important articles to read.

Expensive Long Lens Advantages and Disadvantages

To me, the biggest advantages expensive lenses have are they are built super tough, so they withstand the bruises I give to them when photographing a lot. Plus, they are typically fast. That means they have a large maximum aperture with f/4 being typical. That big piece of glass greatly inflates the cost of a lens and makes it bulkier and heavier to carry. Although the maximum aperture on the Canon RF 100-500mm lens is only f/7.1, that is 1 2/3 stops slower than the Canon 500mm f/4. That means if the exposure for a bird is ISO 800, f/5.6, and 1/250 second with the Canon 500mm f/4, the Canon RF 100-500mm lens cannot open up to f/4, so the exposure must be changed with either pushing up the ISO 1 2/3 stops or slowing the shutter down by that much or gain that 1 2/3 stops by getting some light from both the ISO and the shutter speed. This forces you to use either more ISO than you wish or more shutter speed and both can be problems that make it more difficult to capture quality photos. Fortunately, both increasing the ISO or lowering the shutter speed are more doable than they were years ago. Higher ISOs continue to be less noisy and produce better images and slower shutter speeds are helped out with improved image-stabilization. That means you can successfully photograph with higher ISOs and use slower shutter speeds.



Figure 5 ISO 320, 1/1000 second, with f/8 captured this vermilion flycatcher handheld with a Canon 100-400mm lens.

Traveling is much easier with lighter and less bulky camera gear, especially air travel. Where I once used the Canon 200-400mm and Canon 100-400mm zoom lenses on my Kenya safaris, I now use the lighter Canon RF 100-500mm lens that covers more reach than the first two lenses mentioned. Plus, with the built-in crop factor of the Canon R5, I set it to a 1.6x crop and then the Canon 100-500mm has the angle of view of a 160mm to 800mm lens. Imagine the convenience of using one lens that covers everything from 100mm to 800mm. Now, do not get me wrong. The crop factor does not suddenly convert the Canon 100-500mm into a 160-800mm lens, but the angle of view is similar to the longer focal length and the subject looks much larger in the camera's viewfinder. Since the large RAW file of the Canon R5 is 45MP, the in-camera 1.6x crop still is about 17MP, plenty large enough for most uses and the crop is from the center of the lens and that is the sharpest part! Plus, the Canon 100-500mm lens is much more handholdable than a prime 600mm f/4 lens.

Expensive Lens Advantages

1. The far more expensive glass will likely produce a slightly sharper image
2. Better to use in low light due to the faster maximum aperture
3. Due to the faster aperture, it is easier to use lower ISOs and faster shutter speeds
4. May autofocus faster and more accurately
5. Readily takes teleconverters while retaining sharpness and autofocus
6. Many expensive lenses focus a little closer than less expensive lenses
7. Spending all that money makes you feel good about supporting the economy (okay - maybe not)

Less Costly Lens Advantages

1. The lower price makes it easier to buy for far more shutterbugs
2. Lighter lenses are easier to carry with you
3. Easier to travel with and take on planes since they take up less space
4. With excellent photo technique, the images from these lenses are excellent
5. Less expensive to upgrade to a newer version

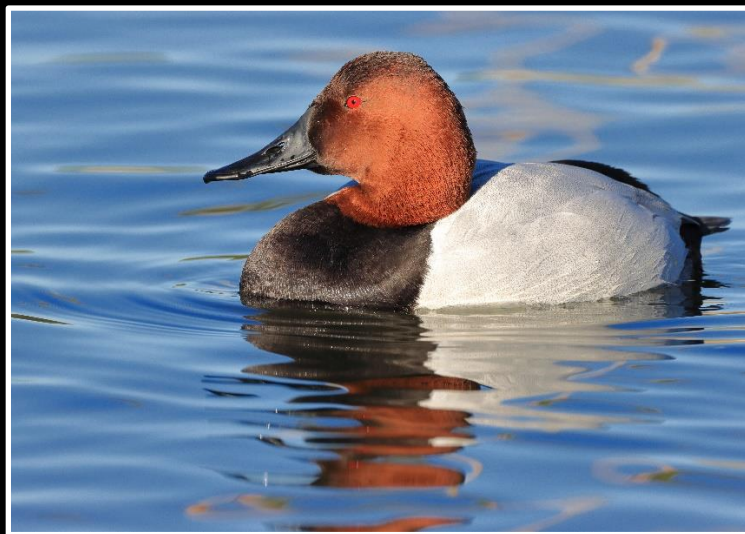


Figure 6 A drake canvasback rests on a pond in downtown Phoenix, AZ. The Canon 1DX Mark III with the Canon 600mm f/4 lens filled the viewfinder with duck. Exposure is ISO 500 with 1/800 second and f/8. Exposure is set in all of these images to produce the first blinkies in the subject. In this case, blinkies first appear in the white feathers.

What am I Using

In the past few years, I have used five Canon lenses for wildlife photography. These include:

1. Canon 100-400mm
2. Canon 200-400mm
3. Canon RF 100-500mm f/7.1
4. Canon 600mm f/4 III
5. Canon 800mm f/5.6

All of these are excellent lenses, but two I have sold. Both the Canon 100-400mm and the Canon 800mm f/5.6 lens I no longer own. I sold the 800mm to a friend who wanted to photograph birds and I gave him a really good price on it – less than half the price of a new one. The Canon 100-400 got sold because it is designed for DSLRs, and I now prefer the mirrorless Canon R5. Though the adapter I have for the mirrorless system lets me use a non-RF lens on the mirrorless camera, I did not need the Canon 100-400mm any longer because I prefer the greater focal length range of the RF 100-500mm lens. That extra 100mm in focal length often comes in quite handy. I still need the RF adapter for my Canon 600mm f/4 and for my Canon 180mm macro.

- ~~1. Canon 100-400mm~~
2. Canon 200-400mm
3. Canon RF 100-500mm
4. Canon 600mm f/4 III
- ~~5. Canon 800mm f/5.6~~

This leaves three lenses for wildlife. I have the wonderful Canon 200-400mm lens with a built-in 1.4x teleconverter. By pressing a lever on the lens mount, the tiny 1.4x teleconverter slides into the optical path converting the lens to a 160mm – 520mm lens. That works really well in photo blinds or on a Kenya safari where you are confined to one spot – inside the blind or vehicle. That works but it is heavy and bulky and not easy to handhold at all. Though I am not a fan of handholding, there are times when it is necessary, especially for flying birds. It is a wonderful lens, but that one might get sold. I really do not need it since I prefer to use the Canon 100-500mm f/7.1 lens for wildlife when they are close enough. And with the mirrorless RF, I often use the 1.6x crop in that camera to make the lens have the angle of view of 800mm. That works really well. Though the 1.6x crop in the Canon R5 reduces the RAW file size from 45MPs to about 17MPs, that still produces a fine photo with lots of detail if you do not print it too large.



Figure 7 This female cardinal prepares to land on this cactus. Using a Canon 600mm lens, the exposure was 1/4000 second, f/7.1, and ISO 2000. Everything was set manually, including the focus on the spines on top of the cactus.

I use the Canon R5 with the 100-500mm lens most of the time when photographing in a blind at my seed feeder stations, small ponds I construct to lure wildlife to good photo range, and to my dripping water setups. Being able to zoom the lens to fit the size of the bird and the situation it is in is enormously useful. This combination is amazingly effective for wildlife photography. By using the 1.6x crop factor built into the camera, effectively it becomes a 160 – 800mm lens with the same maximum aperture. Though the image file is reduced from 45MP to about 17MPs, that remains a lot of data and you are also using the sharpest portion of any lens. When coupled with IBIS (in body image stabilization) and eye focus, this means it produces sharp images quite easily.

As I write this, I just heard Canon will soon introduce the new RF Canon 600mm lens. It is made for the mirrorless cameras. As I already have the 600mm f/4 lens and use it on my Canon R5 with the mirrorless adapter, I wonder if I will pay the money to buy the new one and sell the old one at a loss. It works fine as it is. But perhaps there is a quality or ease of use reason for buying the new RF 600mm model. If there is a clear reason to do so, then I see myself buying the new 600mm. Time will tell.

Fortunately, there are plenty of choices for achieving a long focal length with the assortment of long lenses available, or teleconverters on shorter lenses, or crop factors making the lens appear to be longer

or any of these combinations. Heck, I have used a 600mm lens with a 1.4x teleconverter to photograph yellow-crowned night herons with the in-camera 1.6x crop factor too. That image appears below. And it worked quite well. Enjoy your photography, choose wisely, and shoot a lot of pleasing images.



Figure 8 A yellow-crowned night heron rests in the cattails in Texas. I could not approach closer as there was a mucky pond in front of me and that was guarded by a huge alligator. To capture a big image of the night heron in the viewfinder, I used the Canon 600mm f/4 III lens, a 1.4x teleconverter, and the camera set to 1.6x crop mode. Altogether, that is 1344mm. That did the trick. Exposure was problematic as the sun continually went in and out of the clouds, so I used Auto ISO while manually setting the shutter speed to 1/800 second, f/7.1, the ISO automatically set to ISO 1250, and a +2/3-stop exposure compensation. Of course, this was done on a tripod!



Figure 9 A crested caracara swoops in to land. ISO 1600 with a shutter speed of 1/3200 at f/7.1 captured the action using a Canon 100-500mm lens at 500mm.



Figure 10 I spotted the purple gallinule hunting in thick weeds at Brazos Bend State Park in Texas. I could not photograph it in the weeds, but saw it was working its way toward a six-foot open area. I moved down the trail 20 yards and waited for it to arrive. When it popped out into the open, I was ready and shot about 50 images using the electronic shutter on the Canon R5. That is a rate of 20 images per second! Canon 600mm with camera in 1.6x crop mode for a 960mm angle of view.



Figure 11 The Canon 600mm lens provided the reach I needed to fill the viewfinder with this American bittern at Brazos Bend State Park in Texas. This is one of the few birds where my eye focus in the Canon R5 failed. Apparently, the eye blends in too much with bird's camo pattern.



Figure 12 The roseate spoonbill was photographed when it surprised me while photographing laughing gulls in flight in Galveston, TX. The easy to hand-hold Canon R5 with the Canon 100-500mm lens worked perfectly.



Figure 13 Here is the laughing gull I was photographing when the spoonbill suddenly appeared!



Figure 14 The Canon R5 and 600mm lens nicely captured this yellow-crowned night heron among the flowers along the Brazos River. This heron was perfectly tame, but I had to back off due to the long prime 600mm lens it was. If I had the 100-500mm lens, that would have given me more composition choices.

As I revise this article on May 19, 2023, I primarily use two lens choices when photographing wildlife. When I need the reach with longer focal lengths, I prefer the Canon 600mm lens on the Canon R5, and when I need more reach, I set the camera to the 1.6x crop mode giving me the angle of view of a whopping 960mm lens. And if I know the light will be dim (a cloudy morning forecast for example), I tend to favor the prime lenses with the larger aperture. Being able to shoot using f/4 rather than f/5.6 means I can use a less noisy ISO or use a little faster shutter speed.

When I must adjust the focal length continually due to different shooting distances or different sized subjects at the same distance, then the Canon 100-500mm f/7.1 lens is my first choice. Again, with the crop mode, it provides the lens with a 160-800mm field of view.

During the first five months of 2023, I co-taught 8 wildlife field workshops and shot a lot on my own. I easily shot more than ½ million wildlife photos and slowly evolved my photo strategy. I was using the Canon R5 with the RF 100-500mm f/7.1 lens with the RF 1.4x teleconverter most of the time. This

combination worked amazingly well. With the Canon RF 100-500mm f/7.1 lens and the RF 1.4x teleconverter, the lens combination covers 420mm to 700mm. The 1.4x teleconverter cost one stop of light, so that combination slowed down even more to f/10. While the lens is slow, I found that shooting on a tripod with the image stabilization active in Mode 1 still made it fairly easy for me to shoot sharp photos. And keep in mind the lens is effectively a 700mm lens when the 1.4x teleconverter is used, and that can be extended by switching my Canon R5 to the 1.6x crop mode. Now I have the reach of 700mm x 1.6 = 1120mm! And I still have the close focusing small birds like warblers and small mammals too like chipmunks. All of the images below were made with the RF 100-700mm lens and the 1.4x teleconverter. Northern cardinal, common ground dove, rose-breasted grosbeak, bobwhite, and crested caracara are the birds in these images.

