CHOOSING YOUR lens

TEXT & PHOTOGRAPHS **PETER RYAN**

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DIGITAL PHOTOGRAPHY has seen a revolution in the use of cameras by birders. Now it's the norm to see birders laden with lenses long enough to be the envy of any dedicated paparazzo. And if you are lucky enough to find a rare bird, the first question will be 'Where are the photographs?' Getting started can be daunting. The most important question is what lens to buy, not least because this is the most expensive part of the equation. **Peter Ryan** and a panel of birders review some of the less expensive options for digital SLRs.

UNTIL RECENTLY, all you needed to start birding was a pair of binoculars, a field guide and a notebook. The more serious birder would want to invest in a spotting scope with a decent tripod, and perhaps some recording/playback equipment, but that was it. A camera with a telephoto lens long enough to take even halfway decent images was not on the wishlist of most birders, who were content to leave cameras to that quite different species, the bird photographer.

This was a matter of time and cost. Taking photographs of birds is not easy: to get a good image you either need to spend days setting up the shoot (and even then you're not guaranteed to get the shot), or you need to take a lot of images and hope that a few of them succeed. And that was a costly exercise when you were working with film. The digital era changed all that. Now, once you have invested in a camera and lens, you can take thousands of images at no cost. This freedom to experiment, coupled with improvements in autofocus systems, has seen a revolution in the quality of bird images, especially of birds in flight. It is also responsible for cameras becoming an essential birding tool. Not sure if that's an Antarctic or Slender-billed Prion? Take some pictures and work it out later…

SLR or not?

So what do you need to get started? One option is to take advantage of your spotting scope, if you have one. Scopes typically magnify 20–60x, providing stunning images equivalent to lenses with a focal length of 1 000–3 000 mm. You can get adapters to fit a single-lens reflex (SLR) camera to most scopes, but unfortunately cameras are more demanding than your eyes. They require a lot more light, and the best results from 'digiscoping' use cameras with a tiny sensor,

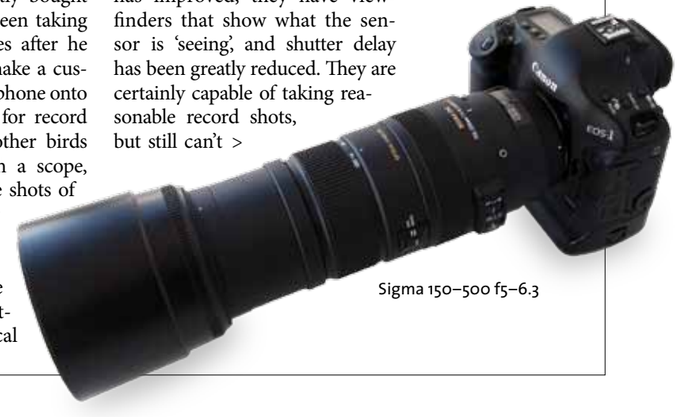
above *The Sigma 150–600 Sports shows impressive depth of field on this female Orange-breasted Sunbird photographed at 600 mm.*

opposite *Many birders now spend more time looking through their camera lenses than their binoculars!*

THIS FREEDOM TO EXPERIMENT, COUPLED WITH IMPROVEMENTS IN AUTOFOCUS SYSTEMS, HAS SEEN A **REVOLUTION IN THE QUALITY OF BIRD IMAGES**

such as those found in a 'point-and-shoot' camera or even a cell phone. A friend recently bought a new scope and has been taking some impressive images after he used a 3D-printer to make a custom housing to clip his phone onto the eyepiece. It's great for record shots of waders and other birds typically observed with a scope, but it's not easy to take shots of birds in action – or from a moving boat!

High-magnification compact cameras are another option. The latest models offer optical magnifications of up to 60–80x in a small, user-friendly package for less than R10 000. Historically, they struggled to compete because their image quality was much poorer than the larger format SLR cameras and, more critically, you had to rely on the LCD screen at the back of the camera to compose the image. Also, the slight lag between pressing the button and the image being captured made it difficult to photograph birds in motion. The latest models have partly overcome these issues; image quality has improved, they have viewfinders that show what the sensor is 'seeing', and shutter delay has been greatly reduced. They are certainly capable of taking reasonable record shots, but still can't >



Sigma 150–500 f5–6.3

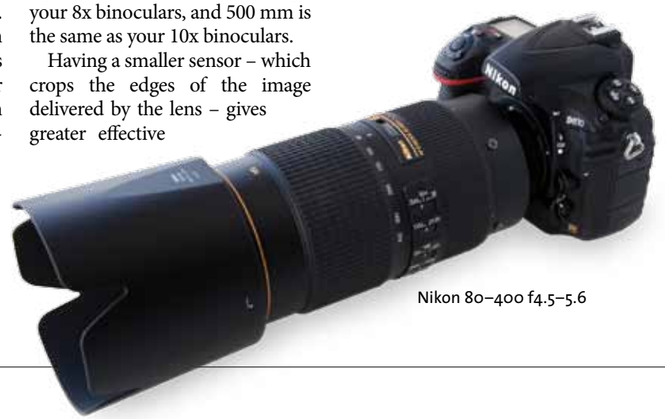
The Sigma 150–600 Sports consistently delivered crisp results, even at full zoom. This image of a female Yellow Bishop also shows the aesthetically pleasing bokeh produced by the long focal length.

compete with SLRs when it comes to taking high-quality images of birds under a wide range of conditions.

If you decide to get an SLR, the choice of which body to buy is beyond the scope of this review (see box on page 50, the Canon versus Nikon debate). In general, the lens is the more important item: even the best body won't take good images through a poor lens. Also, bodies evolve faster than lenses, so it's better to get a lens that will last a long time, rather than spending a lot of money on a top-end body that will be superseded within a few years.

However, it's important to bear in mind the sensor size of the camera. All the lenses in this review can be used on full-frame as well as smaller-sensor SLRs (this is not always the case as some cheaper lenses are designed specifically for small-sensor SLRs and do not work on full-frame bodies). The sensor size affects the magnification a given lens delivers. The magnification can be estimated from the focal length: on a full-frame body, 50 mm = life size, 100 mm = 2x life size, 200 mm = 4x life size, and so on. So you need a 400-mm lens to give you an image equivalent to what you see through your 8x binoculars, and 500 mm is the same as your 10x binoculars.

Having a smaller sensor – which crops the edges of the image delivered by the lens – gives greater effective magnification. The size of this effect depends on how much smaller the sensor is than a full-frame (36 x 24 mm) sensor. For most Nikon SLRs the crop factor is about 1.5x, whereas most Canon SLRs have a crop factor of 1.6x. To calculate the effective focal length, multiply the focal length by the crop factor, so a 400-mm lens is an effective 600-mm lens on a small-sensor



Nikon 80–400 f4.5–5.6

TECH SPECS

The cost, specifications and performance of eight entry-level birding lenses for SLR cameras

LENS	Price (RRP, incl. VAT)	Mass* (g)	Length (mm**)	Zoom length (mm)	Objective (mm)	Image stabilised?	Close focus (m)	Weather sealed?	Build quality	Ease of use	Focus speed	Image quality
Sigma 150–500 f5–6.3	R12 790	1 855	344	65	86	yes	2.0	no	3.1	3.3	3.2	3.9
Canon 400 f5.6	R13 695	1 350	325	–	77	no	3.4	no	3.9	4.4	4.3	4.5
Sigma 150–600 f5–6.3 Contemporary	R13 995	2 035	340	80	95	yes	2.6	no	3.2	3.2	3.3	4.0
Tamron 150–600 f5–6.3	R14 690	2 110	340	79	95	yes	2.4	no	2.9	3.0	3.1	3.9
Sigma 50–500 f4.5–6.3	R17 695	2 070	290	87	95	yes	0.5–1.7	no	3.4	3.4	3.2	4.0
Canon 100–400 f4.5–5.6 Mark II	R23 195	1 700	274	77	77	yes	0.8–0.9	yes	4.2	4.1	4.2	4.5
Sigma 150–600 f5–6.3 Sports	R26 995	3 155	380	92	105	yes	2.3	yes	3.8	3.2	3.6	4.3
Nikon 80–400 f4.5–5.6	R41 995	1 650	204	57	77	yes	1.5	yes	3.9	4.0	4.1	4.4

*includes hood and tripod mount; **zoomed in with lens hood attached; values in red are out of 5

Nikon and 640 mm on a Canon SLR (giving 12x and 12.8x magnification, respectively). Compact cameras achieve their high optical magnifications by having very high crop factors. Their small sensors limit their ability to operate under low light conditions, and their images degrade faster as you boost sensor ISO (the sensitivity to light).

Selecting the contenders

For most birders, photography is largely opportunistic – taking pictures of birds encountered while birding, rather than setting up hides to get very close to them. As a result, birders tend to use ultra-telephoto lenses that have a focal length of at least 400 mm. The magnification delivered by a 300-mm lens is a bit limiting, even with a small sensor SLR. Most people using 300-mm lenses use the optically superb f2.8 lenses and couple them with a 1.4x tele-converter to gain the desired extra 'reach'. The problem is that these lenses cost R70 000 to R100 000, depending on your camera body. You can obtain f4 300-mm lenses for about a quarter of this price but, by the time you add a tele-converter, they are not really competitive in terms of price, image quality or versatility.

Until recently, most bird photographers used fixed focal-length (so-called 'prime') lenses, because the optical quality of zoom lenses – especially at long focal lengths – was not really up to scratch. However, the latest zoom lenses offer impressive image quality in the focal lengths desired by birders. Top of the range are the fixed aperture f4 200–400-mm lenses, but these are large, heavy and very expensive (more than R100 000). For this review, we >

Barrie Rose gets to grips with Tamron's 150–600-mm lens.

Sigma 50–500 f4.5–6.3

The versatile Sigma 50–500 wasn't always pin sharp, but still produced many pleasing images, such as of this Red-faced Mousebird.

selected lenses that reach at least 400 mm and won't require you to mortgage your house to buy. We considered only one prime lens – Canon's compact f5.6 400-mm lens – because all the other primes are outside our price range, starting at around R70 000.

Panel members were asked to rate each lens in terms of ease of use (based on size, balance, location and design of controls, etc.), build quality (robustness, finishing, etc.), focus speed and image quality. The reviewers were largely restricted to static subjects, but had the chance to take pictures under a variety of light conditions. Based on these trials, three of the lenses were selected for field-testing: Canon's 100–400-mm zoom, and Sigma's 50–500-mm and 150–600-mm Sports zooms. All images were taken with a Canon 1D Mark IV body.

The findings

The main specifications of the eight lenses reviewed are summarised together with the panel's assessments in the Table on page 47. There were three 400-mm lenses: the Canon 400-mm f5.6 prime, the newly released Mark II version of Canon's popular 100–400-mm f4.5–5.6 zoom, and Nikon's equivalent, the appreciably more expensive 80–400-mm f4.5–5.6 zoom. At around 1.3 kg, Canon's f5.6 fixed 400-mm lens is the lightest of those on offer, produces fast focusing and sharp images, and is good value at a shade under R14 000. However, it lacks image stabilisation, which is handy under low-light conditions, is not rated as fully weather sealed, and at 3.5 metres it has the worst close-focus limit of all the lenses on offer.

If you think 400 mm is enough lens for you, you'd be better off with Canon's new 100–400 mm. Although it costs almost R10 000 more than the straight 400 mm, it offers virtually the same optical performance with the benefit of a great image stabilisation system (good for 4 to 5 stops), the versatility of its big zoom range, and a remarkable close focus distance of barely 0.5 metres from the end of the lens to the subject. As one might expect, Nikon's 80–400 mm also offers great optical performance over its slightly greater zoom range, but at almost twice the price of Canon's lens it struggles to compete in terms of value. Its close focus distance, while not bad at 1.5 metres, is not as impressive as the Canon lens. And although well designed and with the fastest zoom action of the lenses reviewed, it felt a bit plastic compared to the Canon.

The panel was so impressed with Canon's 100–400-mm Mark II lens that they all selected it as the product they'd most like to have. A large part of its appeal is its small size and versatility. It is a bit shorter than Canon's 70–200-mm f2.8 lens and only slightly heavier, yet gives you twice the reach and focuses even closer. It weighs barely half as much as Canon's 200–400-mm f4 lens, making it much more attractive to carry on long hikes, and costs less than a quarter of the price.

I can see the 100–400 Mark II displacing Canon's 70–200-mm f2.8 lens from many photographers' kit bags because the greater reach of the long zoom largely outweighs the benefit of the larger aperture, unless you're doing a lot of shooting in low-light conditions. In addition, the close focus distance is great for shooting smaller subjects like butterflies, dragonflies, frogs and reptiles. It's appreciably sharper than its predecessor, and the switch to a screw-out zoom (rather than the push-pull system of the old model) allays concerns about dust being sucked into the mechanism. The lens is fully weather sealed and feels reassuringly solid and well built. It's not without its drawbacks though: it took a bit of getting used to having the zoom beyond the focus ring, and you can't really zoom at all if you have the hood stored backwards on the lens.

THE PANEL WAS SO IMPRESSED WITH CANON'S 100–400-MM MARK II LENS THAT THEY ALL SELECTED IT AS THE **PRODUCT THEY'D MOST LIKE TO HAVE**

Going big

Despite its wide appeal, Canon's 100–400 mm is a bit short to be a primary birding lens. There's no doubting its versatility, and it is a great 'walking around' lens, but it wouldn't be my first choice for the bulk of my bird photography. Time and again I found myself wanting a bit more reach than the 400 mm offers. If you choose it >

Tamron 150–600 f5–6.3

COMBATING ZOOM CREEP

Although some top-end telephoto zoom lenses have internal mechanisms, most extend as you zoom in. This applies to all the zoom lenses in this review, with total lens length increasing seven to nine centimetres (see Table, page 47). Apart from the inherent problems of having external moving parts, this system creates the problem of zoom 'creep' – your zoom moving in or out under the influence of gravity. This is annoying enough when you're walking along and your lens starts extending of its own volition, but it's even worse if the zoom slides as you're taking images.

All the lenses under review have a zoom lock system, but this varies among manufacturers and models. The Nikon, Tamron and Sigma 50–500-mm and 150–500-mm lenses only lock at the minimum zoom position, preventing the lens from extending when pointing down (which is often the case when carrying the camera and lens). Both Sigma 150–600-mm lenses have a full lock in this position, and then partial locks at each marked focal length point (180, 200, 250, 300, 400, 500 and 600 mm), which can be over-ridden by turning the zoom control. This is important for the massive Sports model, because the zoom slides in if you point the lens up to photograph a bird overhead. However, this is not as serious an issue as you might think because you tend to hold the zoom ring while photographing, preventing any creep. The Canon 100–400 mm has probably the best system: a ring just behind the zoom control that allows you to manage the tension on the zoom action.

Sigma 150–600
f5–6.3 Contemporary

Sigma 150–600
f5–6.3 Sports

opposite, above
Canon's new 100–400 zoom has the most impressive close focus distance, allowing intimate portraits of confiding birds.

opposite, below
Despite the smaller aperture, Canon's 100–400 zoom copes well even in shaded situations, such as with this Red-necked Spurfowl.

as your primary lens, you'd want to pair it with a small sensor camera body, so you get the added boost of the crop factor. You can add a 1.4x tele-converter, but this makes it an f8 560 mm, greatly slowing the autofocus, which is restricted to the central focus point.

Neither Canon nor Nikon makes a zoom lens longer than 400 mm, and their 500-, 600- and 800-mm primes cost the same as a small car. But Sigma and Tamron both offer zoom lenses that reach to 500 and 600 mm and don't cost an arm and a leg. This was new territory for the panel, and in general we were impressed by the quality of the images delivered. In good light there was little to choose between the images delivered by all eight lenses under review, even at maximum zoom. The longer lenses are limited to f6.3 at full magnification, but with ever-improving sensors, this relatively small aperture can be compensated for by boosting the sensor ISO rating. If I were just starting out and had a modest budget, I would look very seriously at these lenses.

Perhaps the most surprising lens was Sigma's 50–500 f4.5–6.3 zoom. It offers an incredible zoom range, equivalent to 1–10x magnification on a full-frame sensor body. There was a bit of vignetting in the corners on a full-frame body, especially at 50 mm, but overall image quality was impressive. And although the close focus distance pushes out as you zoom in, it is still respectably close and took crisp close-ups of flowers with good depth of field. It is well balanced and easy to carry for protracted periods. Not surprisingly, it wasn't as consistent as a prime 500-mm lens, but it took some very acceptable images hand held and wide open at 500 mm. If I could have only one lens, this would be a real contender.

There was little to choose between the Tamron 150–600 f5–6.3 zoom and Sigma's 'Contemporary' model with the same specifications. Most of the panel preferred the slightly cheaper Sigma model because of its shorter zoom action (the Tamron has to be cranked round almost 180 degrees to go from 150 to 600 mm, compared to about 145 degrees for the Sigma), the more conveniently located and more sophisticated zoom lock switch (on the left of the Sigma, and right of the Tamron), better intermediate focus option (10 versus 15 metres), and Japanese (not Chinese) manufacture. The Tamron might appeal more to Nikon users though, as its zoom direction follows the Nikon convention of zooming in by twisting clockwise, whereas Sigma, like Canon lenses, zoom in anti-clockwise.

Sigma's 150–500 mm is a slightly smaller, lighter and cheaper version of the 150–600 Contemporary lens. It focuses a bit closer (2.0 compared to 2.6 metres), but doesn't have the option to select two autofocus ranges, so it can take a bit longer to focus.

The main drawback to all these lenses, however, is their lack of weather proofing. The only third-party lens rated as weather proof is Sigma's 150–600-mm f5–6.3 Sports. This is quite a different beast from all the other third-party lenses, designed in the same style as the big prime lenses from Canon and Nikon. It has a metal, screw-on lens hood and a wrap-around objective cover, not a plastic hood and clip-on lens cap. The tripod mount cannot be removed, but allows the lens to be rotated and has click stops every 90 degrees to aid levelling.

At a shade over three kilograms with its heavy lens hood attached, the Sports model weighs 1.1 kilograms more than Sigma's Contemporary model, and is similar in weight to Canon's 500-mm f4 Mark II lens. As a result, you're probably going to want to use it with a monopod or tripod much of the time. Luckily it has three attachment points on the mount foot, so you can attach a sling and a monopod or tripod head (all the other lenses reviewed have only a single attachment point).

The greater mass is not just a result of the heavier construction; it has a 105-mm objective lens compared to the 95-mm objectives on the other 600-mm zooms, and a different lens system, with four extra elements. Technical tests show this delivers better performance, and it certainly delivered impressive images under field trials. To me, one of the main advantages of this lens was the likelihood that it would survive years of birding abuse. If I were being picky, I found the foot a bit close to the lens body, making it awkward to use as a carry handle, and the focus distance selector switch is a bit fiddly.

The verdict

If budget is not an issue, most of the panel would probably go for the Canon 100–400-mm Mark II lens coupled to a Canon 7D Mark II body, a combination >

CANON OR NIKON?

If you decide to go the SLR route, the first question for most people is whether to buy Canon or Nikon. There are several other SLR manufacturers, but most are fairly new to the game (for example, Sony), and don't offer the same range of lenses as their better-established competitors.

I'm not going to go into the pros and cons of Canon versus Nikon – both have their strong points, and armies of vocal supporters. To some extent it boils down to your lens of choice. The Sigma and Tamron lenses reviewed here can be obtained for either system, but they are not interchangeable. If you buy a third-party lens you have to specify whether you want a Canon or Nikon mount. So the choice of body is critical, because once committed, it is expensive to switch.

PERHAPS THE MOST SURPRISING LENS WAS SIGMA'S 50–500 F4.5–6.3 ZOOM. IT OFFERS AN INCREDIBLE ZOOM RANGE

above *A Neddicky shot with Canon's 100–400 zoom; its small size makes this lens easy to carry on long hikes.*

that would set you back about R44 000. But if cost really isn't an issue, you'd probably select a 500- or 600-mm f4 prime lens, or maybe a 200–400 f4 zoom for more than R100 000! For the more casual birder, both the Sigma and Tamron 150–600 zooms offer excellent value for money, and Sigma's 50–500 is an incredibly versatile option if you don't want to change lenses or carry two bodies. But the lack of weather proofing is a concern for all these third-party lenses. Serious birders on a limited budget should consider the Sigma 150–600-mm Sports zoom. Yes, it's heavy, but you wouldn't have to treat it with kid gloves, and it delivers quality images over an impressive magnification range. ◆

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THE PANEL

The panel comprised birders and wildlife enthusiasts who enjoy photographing the animals they encounter. They agreed that the most important criterion for a good lens is image quality, followed by focusing speed, close focusing distance, durability, weight, and ease of transport (especially for longer trips).

Barrie Rose All-round naturalist, best known for his birding at sea. Current gear: Canon 7D and Canon 300 mm f2.8 + 1.4x tele-converter.

Trevor Hardaker SA Rare Bird Alert coordinator. Current gear: Canon 7D and Canon 500 mm f4.

Margaret Hardaker Birder, but also a keen photographer of butterflies and dragonflies. Current gear: Canon 7D and Canon 300 mm f2.8 + 1.4 tele-converter.

Mike Buckham Western Cape record verifier for the bird atlas. Current gear: Canon 7D and Canon 400 mm f5.6.

Peter Ryan Ornithologist and birder. Current gear: Canon 1D Mk IV and Canon 500 mm f4 Mark II.