Wildlife Photography

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On Safari with Your DSLR: Equipment, Techniques, Workflow

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On Safari with Your DSLR:
Equipment, Techniques, Workflow
A wildlife photography reference book that only looks at Africa? And one that only covers the Serengeti ecosystem? But what if you want to take photos in the Arctic, or in a tropical rainforest, or in one of a thousand other places?

Don’t worry, this is exactly the right book for you!

I could go ahead and describe most of the species on the planet and the shooting techniques necessary in their individual habitats, but that would be a rather perfunctory approach that wouldn’t help you very much at all. Alternatively, I could write a 30-volume encyclopedia covering wildlife photography the world over—but that would only drown you in a flood of information collected by someone else. Information that you cannot personally recall is rarely of any practical use.

This is why I have deliberately restricted myself to the single geographical area covered by the East African Serengeti—one of the largest and most intact ecosystems on our planet. The Serengeti’s biodiversity and its sheer number of indigenous species and predators are truly unique.

The basic knowledge of animal behavior and habitat that you will need to take great photos in the Serengeti can be directly applied to other locations, too. This book aims to help you develop your own approach so that you can plan trips specifically aimed at photographing the animals you want in the location of your choice. Your general approach and your detailed plan will then be pretty much the same wherever you go.

You can only really photograph wildlife successfully if you respect the environment and work in harmony with nature while you learn to observe your subject properly. Specialized knowledge of “where, when, and what” often means the difference between a great, action-packed image and an unexciting, everyday photo. The right knowledge helps you to capture a hunting lion instead of a sleeping one, or a breaching whale instead of the spot where it disappeared into the deep.

You will also have to master the technical aspects of photography, observe the basic rules of image composition, and, of course, rely on your intuition and, now and again, your photographer’s luck.

I consider wildlife photography to be part of the documentary oeuvre, which is why I have included some fairly brutal photos in this book. I observed the death throes of a gnu, including the audible cracking of its bones, for over an hour—you, however, can simply turn the page if you wish. I watched a famished cheetah that was so confused by a posse of about 30 tourist jeeps that it ate a live baby gazelle for fear of losing its next meal—an act that is completely out of character for a big cat. I waited for all the other vehicles to leave and
got as near to the cheetah as possible so that I could capture the true fear and panic in its eyes.

If you find my portrayal of nature too harsh—and, let’s face it, we humans like to imagine nature as peaceful and harmonious—you should take a look at James Nachtwey’s coffee-table book *Inferno*, which documents the actions of the most brutal of all creatures on Earth: mankind. Although his work covers a completely different subject area, Nachtwey’s approach to photography is a great basis for successful wildlife photography. Without inferring that I am in any way as good as he is, I consider his concept of “critical distance” (i.e., making himself invisible so as not to intrude) to be the key to my own technique. If you are photographing people—even in extremely stressful situations—you can gain the trust necessary to press the shutter with a glance or a gesture. Gaining the trust of an animal takes much longer.

All of the photos in this book were taken with patience and respect. All of the close-ups resulted from the subject approaching out of curiosity, or by rolling slowly towards the subject with the engine of the vehicle switched off. No mother had to hide her young from me, and no cheetah felt the need to chase her cubs off in all directions, as they often do when confronted with massed tourists. Not a single animal had to give up its chase or lose its prey because of my presence. I never parked my jeep where gnus leave the water when they are crossing the Mara River. Sensation-seeking tourists often force gnus into deep water, causing them to drown by the hundreds and thousands for the sake of some snapshots.

Respect for the subject should be at the top of the list in every wildlife photographer’s rulebook. Rather than destroy what we love, we should all work hard to help it survive and generate public interest in our work.

The situations I describe involving predators sometimes involve calculated risks based on years of experience. I don’t take uncalculated risks; when I am unsure of my ground, I use skilled local guides to keep things safe.

Don’t take risks. Every accident involving wildlife and tourists (however small) is a bonanza for the international press. Unwanted attention leads to a decrease in tourism, which in turn means that the local rangers can no longer get paid and that poaching increases.
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Wildlife Photography

One day, if I have the time and the money, I am going to spend a few weeks in Africa and finally take a long, live look at the animals I've been photographing all these years.

Many successful wildlife photographers have said similar things in the past, and it is only really the location that varies. Wildlife photography reminds me of an old paradox from my religious instruction classes in school:

“Praying while you are working is OK, but working while you are praying is forbidden.”

This paradox perfectly embodies the dilemma faced by every wildlife photographer: You can’t observe wildlife carefully and photograph the animals you observe successfully, but you can combine successful wildlife photography with the scientific observation of animals. Focused, precise observation is, in fact, an absolute must if you want to photograph wild animals.

Let’s compare two scenarios:

The focused observer uses his eyes and his binoculars to observe and remember behavioral patterns or parts of a scene directly. Here, the visual experience is more important than an image observed later on a monitor or as a print. If the wildlife observer sees a particularly interesting or exciting scenario, he will most likely pull out his camera and end up taking home plenty of great images.

A wildlife observer can visit zoos and game reserves at just about any time of year, and package vacation deals make it possible to combine great experiences with the chance to take great photos.

A wildlife photographer uses a completely different, more measured approach. He plans individual photos, studies the behavior of specific species, and, as far as possible, adjusts his behavior to suit that of his subject. The wildlife photographer observes through the camera and continually divides his attention between the narrow field of view of a telephoto lens and the overall scene confronting him. He has to concentrate on his subject while keeping his camera settings under constant control.

A wildlife photographer’s travel companions quickly learn that comments such as “Look at the lion over there on the right” are extremely relative when seen through a 500 mm or 600 mm lens. This is the point at which we start using phrases such as “Lion moving at two o’clock”. As soon as the action starts, the photographer has to maintain his image composition while adjusting camera settings to account for changes in lighting. He also has to check and adjust focus, even if he is using a modern, high-power autofocus system. And remember, the subject is an animal that can be moving at up to 45 mph, possibly straight at you!

When you are shooting fast motor-drive sequences, the hordes of flashing displays, the blinking focus area indicators, and the flicker of the camera mirror
in the viewfinder make the view through the lens quite surreal. And then, when sweat runs into your eyes, you often end up only really seeing what was going on when you view your images later on your computer monitor. But you still have a chance of shooting an image that no one has ever seen before.

A wildlife photographer must prepare for each trip meticulously, becoming familiar with local shooting conditions as well as the habitat, the habits, and the migratory behavior of his chosen subject. Trips like this involve significant expense, but always follow the ultimate goal of putting the photographer “in the right place at the right time”. Increasing experience and concentration can help the wildlife photographer to gain a completely new view of nature—a view that is often more detailed than that of a highly-trained scientist. Modern technology can even help today’s wildlife photographer take a look back into primordial times.

I have drawn this comparison to help you to decide whether you want to just “observe and snap” or whether you want to pursue wildlife photography in depth, based on your own visual ideas. The outcome of this decision will have a significant effect on your choice of equipment, your choice of future destinations, and maybe even your entire life plan.

Although I have included some fairly detailed discussions of photographic technique, the main aim of this book is to help you to photograph wildlife successfully based on detailed knowledge of habitat and animal behavior. Wildlife photography should not be based on luck or coincidence, but rather on the ability to predict when a situation will arise, even if this takes hours or days. It is important to remember that even a well-planned scenario can simply fail to occur at all. I will use the Serengeti ecosystem—one of the most fascinating wildlife regions in the world—to illustrate my point.

The Serengeti is one of the most densely populated wildlife reserves on Earth. It is a microcosm that counts nearly all known African predators and large mammals among its inhabitants, including lions, leopards, cheetahs, rhinoceroses, elephants, buffalo, giraffes, crocodiles, gazelles, and antelopes. Even African wild dogs, previously thought to have been wiped out by the canine parvovirus, have been sighted recently. And then there are the huge herds of gnus and zebras that spend the whole year grazing through the region. We will follow these animals on the way to learning the basic principles of practical wildlife photography.

I hope that the biologists among you will forgive my sometimes casual descriptions of the complex biological processes that comprise the Serengeti’s ecosystem. My principal aim is to communicate the knowledge necessary to succeed at photographing wildlife.
Part 1
The Basics

Chapter 3
Image Composition

Chapter 4
Planning Your Trip
Chapter 1
Equipment
A Complete Professional Wildlife Photography Kit
A high-resolution, full-frame camera body for landscapes, animal portraits, and non-moving subjects; a low-noise, high-speed, full-frame camera body for action and “available light” photography; an APS-C camera body with 50 percent reserve range; 600mm f/4, 200-400mm f/4, 300mm f/2.8, 70-200mm f/2.8, 24-70mm f/2.8, and 14-24mm f/2.8 professional lenses; a 1.4x teleconverter and a 1.7x teleconverter. Depending on your choice of subject, you can also include macro lenses for close-ups and bright prime lenses (such as a 200mm f/2 or a 400mm f/2.8) for forest shots or other dark scenes.
1.1 Choosing Your Equipment

The gear you use for wildlife photography must combine three important criteria: high speed, the best possible image quality, and lenses that shorten the effective distance between photographer and subject. Additional useful features are robustness; reliable exposure metering systems that continue to function effectively under rapidly changing lighting conditions; and reliable autofocus.

It is of course possible, under appropriate lighting conditions, to capture an important moment using an old SLR camera and a manual telephoto lens. However, recent advances in camera and lens technology make using older equipment uneconomic for today’s professional photographer, and older gear won’t help amateur photographers achieve satisfactory results either. Many of today’s “normal” digital images are created under lighting conditions that would have been impossible to capture with analog technology. For this reason, this book does not address “one-in-a-million” images of extremely rare creatures, and instead limits itself to discussing the general needs of the modern wildlife photographer. Choice of equipment is key, especially for professional photographers who have to fulfill the high image quality demands of photo agencies, publishers, and magazines.

The speed of a camera is defined by the sensitivity of its image sensor and lens, the number of frames per second (fps) that the camera’s motor drive can shoot, and the size and speed of the camera’s data buffer (i.e., the number of images the camera can shoot and store in a single sequence without slowing down its other systems). The light sensitivity of the image sensor is defined by the amount of light necessary for the camera to produce low-noise or noise-free images. The best currently available cameras are 12-megapixel 24 × 36 mm full-frame models, which can have an exposure advantage of up to two full stops (2 EV) compared to cameras with APS-C (16 × 24 mm) sensors or cameras with much higher megapixel values. Photo agencies generally insist that photographers use a maximum ISO value of 400 if their APS-C images are to be used for a double-page magazine spread, whereas images shot using full-frame cameras are acceptable even at ISO values of 1600 and more. Simply put, full-frame cameras can produce usable results under much worse lighting conditions and with shutter speeds up to four times as fast as those used by other cameras. This is, however, only possible if you also use appropriately high-resolution lenses with large maximum apertures.

Professional lenses are generally two stops (2 EV) brighter (i.e., have a maximum aperture that is two stops larger) than the value lenses aimed at the amateur end of the market. Professional lenses are also often equipped with image stabilizing technology, which increases the brightness of the lens by up to four additional f-stops. This is an especially important feature if you want to be sure of getting shake-free results, even if you are using short shutter speeds. A fast motor drive will enable you to capture fast movements in sequences or individual images. A general rule of thumb says that your camera should be capable of
buffering a sequence of 25 shots at maximum resolution without slowing down the motor drive or the camera’s other systems.

If you have no budget limits, your choice of equipment is simple. You should acquire two professional, high-speed, full-frame cameras, plus a “super-camera” with a resolution of 20 megapixels or more. You can then round out your kit with the best and brightest lenses you can find with focal lengths between 14 and 600 mm.

If, however, your budget is limited, you will have to strike a compromise between money and your own photographic aspirations. A fast, high-quality APS-C camera is a good choice, and has the advantage of providing 50 percent more range than the same lenses can produce when used with a full-frame camera. A 400 mm lens used with an APS-C camera will magnify your subject just as much as a 600 mm lens used with a full-frame camera. Another advantage is that you can achieve very good image quality at high burst speeds (5 fps and more) for about a third of the price of a professional, full-frame camera with similar specifications. Your choice of lenses will depend on the type of image you will be shooting most. If big cats, birds of prey, and action photography are your favorite themes, you should purchase the best 300 mm (or better, 400 mm) lens you can afford, complete with an appropriate teleconverter. You can then use less expensive lenses for your shorter focal length shots.

If you prefer shooting nature and landscapes, or if you spend more time photographing slower-moving animals from shorter distances, you should make sure your shorter focal length lenses are of optimum quality. You can then save some money by purchasing a mid-range telephoto zoom (a 70-300 mm plus teleconverter, for example). If possible, you should always carry a reserve camera body too.

My favorite themes are action and predator photography. In the period between 2004 and the end of 2007 (before the first high-speed, full-frame cameras became available), I used only professional-level APS-C cameras. This generation of digital cameras was already of equivalent quality to 4.5 × 6 roll film (i.e., better than 35mm film) and produced images that were well suited to offset printing in books and calendars.

The theoretical resolution of low-sensitivity film is high, but it is often cancelled out by subsequent digital grain reduction processes. There are also increasingly fewer companies that maintain the drum scanners needed to extract maximum resolution out of slide material for subsequent digitization, and use of this antiquated technology can quickly increase printing costs by up to a third. Digital images have already become the standard for reportage, action, and advertising photography, and agencies nowadays only use slides if they are first converted into high-quality digital copies. Analog film photography was a beautiful invention, but it has already been consigned to the history books in most contemporary fields of professional photography.
Shot using a full-frame camera (Nikon FX) and a 400 mm lens

Shot using an APS-C camera (Nikon DX) and a 400 mm lens
**Size comparison**
An APS-C camera (Nikon DX) with a 200-400 mm lens. Both cameras shown here produce the same reproduction ratio and the same image crop.

**Image sensor comparison**
The actual size and naming convention of image sensors vary from manufacturer to manufacturer. The following rule of thumb is valid for the present and the foreseeable future: The smaller the sensor for the same resolution (i.e., number of megapixels), the greater the increase in image noise.

A full-frame camera (Nikon FX) with a 600 mm lens. This camera/lens combination is 50 percent heavier and almost twice as expensive as its APS-C counterpart. An APS-C kit is a good value alternative to a full-frame camera if you are starting out as a professional or semi-professional wildlife photographer. Approximately 80 percent of the photos in this book were shot using APS-C equipment.
An APS-C camera with a couple of bright, high-resolution lenses is a great basic tool for your start as a professional or semi-professional wildlife photographer. The latest semi-professional-level APS-C cameras are already 15–20% more powerful than the ones I used to shoot the images in this book, and are only really inferior to their full-frame counterparts when it comes to the amount of image noise they produce under poor lighting conditions. I have collated the data relating to the focal lengths I have used on a number of trips through East Africa over the past four years in the table below. The lens names relate to the Nikon system that I prefer to use. With the exception of the AF-S VR Zoom-NIKKOR 200-400mm f/4 lens, most of the focal lengths mentioned are also available from other camera and lens manufacturers. The values noted in red are the equivalent full-frame focal lengths.

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<th>Equivalent full-frame focal length</th>
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<tr>
<td>200–400 mm f/4</td>
<td>approx. 300-600 mm</td>
<td>approx. 75%</td>
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<tr>
<td>280-560 mm f/5.6*</td>
<td>approx. 420-840 mm</td>
<td>approx. 8%</td>
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<tr>
<td>340-680 mm f/6.8**</td>
<td>approx. 500-1000 mm</td>
<td>approx. 2%</td>
</tr>
<tr>
<td>70-200 mm f/2.8</td>
<td>approx. 100-300 mm</td>
<td>approx. 10%</td>
</tr>
<tr>
<td>17-55 mm f/2.8</td>
<td>approx. 25-80 mm</td>
<td>approx. 4%</td>
</tr>
<tr>
<td>12-24 mm f/4</td>
<td>approx. 18-35 mm</td>
<td>approx. 1%</td>
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* 200-400mm f/4 with 1.4x teleconverter ** 200-400mm f/4 with 1.7x teleconverter

The table shows that you can cover virtually all important focal lengths using an APS-C camera with a 400 mm lens and a teleconverter. The AF-S VR Zoom-NIKKOR 200-400mm lens mounted on an APS-C camera represents the cream of the currently available super-telephoto lenses, and its closest focusing distance of about six feet makes it ideal for close-ups too. Good value alternatives are either the much slower 80-400 mm lens, or the even cheaper 70-300 mm lens used with a teleconverter.

If you want to use a full-frame camera, you will need either the classic 500mm f/4 or the much heavier 600mm f/4 lens—although this model has a close focus distance of only about 15 feet, and thus has limited use when it comes to shooting close-ups. Generally, full-frame gear is about twice as expensive as APS-C systems. If, however, you intend to work professionally or semi-professionally as a wildlife photographer, sooner or later you will have to bite the bullet and invest in top-flight equipment. And continuing “pixelmania” ensures that the useful working life of a camera body is two years or less.
1.2 Tripods and Other Accessories

You will generally need a tripod, a monopod, a window mount tripod, or a beanbag for your wildlife shots. Manfrotto Super Clamps attached to the roof rails of your vehicle are also a useful alternative mount for your tripod head when shooting long sequences. Beanbags are the most flexible option, but are less useful for pans or other shots that involve camera movement. Whether tripod or head, you should always use the tool with which you feel most comfortable. If you travel by jeep either alone or with a single companion, you should remove the front row of passenger seats. This allows you to permanently set up a heavy tripod as a stable camera platform inside your vehicle, which you can then adjust horizontally with an additional tilt head mounted underneath the main tripod head. You can also use the corners of the sunroof (if necessary with tripod heads mounted on Super Clamps on the roof rails) as extra platforms. Rubber tethers are ideal for securing all your tripod heads to your vehicle. The jolts caused by East African dirt roads and tracks can loosen even half-inch grub screws, and once you have lost a screw in the savannah, it stays lost!

Personally, I use a heavy carbon monopod when I am shooting running animals or chase scenes, and I find it to be more stable and precise than the beanbags favored by many of my colleagues.

Shooting from the side window of a vehicle generally gives you a better perspective on your subject and allows you to use either a car window tripod or a short monopod to support your camera. If you shoot from a kneeling position on the floor of your vehicle, make sure you wear kneepads. A foldable rain jacket is useful not only for keeping out the cold in the mornings, but also for serving as an improvised beanbag or dust cover for your camera.

There are only a few places in the national parks where you are allowed to use a tripod outside of your vehicle. There are, however, walking safaris available along the borders of the parks, and you can easily hire a porter to carry your gear for about $10 per day.
1.3 Using Flash

Today’s flash technology is more intelligent than ever before. TTL or iTTL flash control systems are capable of such subtle flash effects that it is often impossible to tell that flash was used at all. You can use diffusers to shoot virtually shadow-free fill flash photos, and tele attachments can increase flash range to 100 yards and more.

In spite of all these technological aids, I am not a big fan of flash in a wildlife context. Flash often gives an artificial, technical look to natural scenery and lighting. I only use flash for a very few shots where fill flash is unavoidable, or when I am taking shots of nocturnal animals that cannot be photographed any other way. I am also skeptical about using flash for animal welfare reasons. You should only really use flash in the daytime for fill-in effects or when you need rear-curtain flash to create movement effects using longer shutter speeds.

Predators, especially the nocturnal big cats and hyenas, have very light-sensitive eyes. Their pupils become large at dusk and before dawn, making their eyes defenseless against bright light. Using flash can render these animals blind for periods of several minutes or more, which can endanger their lives. You will also find that if you do photograph these animals head-on with flash, the image will show two unusable white circles where the animal’s eyes should be. Film teams and night photographers use night lights with special red filters, while photographers use night sights to view the scene and shoot on infrared film. That said, you can use flash at dusk to photograph animals with eyesight similar to or weaker than that of humans. These include elephants, rhinoceroses, and just about all ungulates (hoofed animals).
1.4 Transporting Your Gear

Transporting large amounts of gear as carry-on baggage is becoming increasingly difficult due to airline restrictions. Generally, African inland flights in small aircraft allow a maximum of 15 kg (33 pounds) of luggage. My photo kit alone often weighs more than 20 kg (40 pounds) without any personal items or clothing. Always clarify baggage questions with your airline or tour operator before leaving home. Checking in a photo backpack nearly always results in damaged equipment. A good trick is to simply hang your camera and your heaviest lens around your neck for check-in. This might make you look as if you are trying to show off, but airlines do not have any restrictions regarding the weight of cameras carried by passengers themselves. In Africa, well-placed $5 or $10 tips can often help things along at the airport, but try to make sure you are not the fourth or fifth person to give a tip, as this can result in a light aircraft not being able to take off at all due to the amount of excess baggage that has been “allowed”! I try to avoid taking inland flights wherever possible, and I am prepared to make longer journeys in a jeep for the sake of simplicity.

When I am travelling alone internationally, I use a normal hand trolley for my camera bodies and a few lenses. I wrap my largest telephoto lens in clothing and pack it in a hard case. Unfortunately, my PELI™Case wasn’t up to the job, and some of my equipment was damaged when it was checked in. Always transport your camera bodies without lenses attached, as heavy telephoto lenses can exert enough leverage to deform a camera’s bayonet flange and skew the autofocus system without causing visible damage. If you are travelling with a companion, most baggage allowance problems can be solved by dividing your gear between you.
1.5 Data Management on the Road

Recent years have seen significant advances in memory card capacities, as well as in read/write speeds. Until recently, it was necessary to continually download image data to a mobile data storage unit if you didn’t want to carry your laptop with you on safari. This often resulted in hours of work emptying 4 GB cards and stand-alone storage units with constantly dead batteries. Nowadays, memory cards are large enough and cheap enough to make temporary storage unnecessary. I don’t know of any currently available mobile data storage solution that can cope with the high speeds and large amounts of data stored on today’s 8, 16, and (soon) 64 GB cards. The RAW image files produced by professional and semi-professional cameras can only really be effectively processed using FireWire hardware or similar high-speed slots on a laptop. Affordable (and safer) alternative storage media are the increasingly popular SSD hard disks offered with many laptops. Whichever solution you choose, sort your day’s material every evening to make the amount of data manageable once you get home. Everyone sorts his/her images differently, depending on their intended use. Reportage photographers save many more images than a wildlife photographer who is on the lookout for a single, special photo. Always delete technically poor images immediately, and it is a good idea to make a backup copy of all your material every evening to a separate medium. Here, you can use an external hard disk, (slow) DVDs, or high capacity CF cards and USB flash drives. If you are camping or travelling in remote areas where there is no guaranteed power source, you will need a power adapter for your vehicle’s cigarette lighter, especially if you are using a laptop. Remember to make sure your vehicle’s cigarette lighter works before you head out!

Stand-alone mobile data storage
These devices were a useful solution between 2003 and 2008. However, today’s CF and SDHC card capacities have made them all but redundant. The USB versions are too slow in comparison to FireWire devices and are generally still equipped with conventional hard disks rather than safer, faster SSDs.

Backup for your wallet
USB flash drives are currently available in capacities of up to 128 GB.

Ansmann vehicle adapter
This accessory connects to the cigarette lighter in your vehicle, and is indispensable for trips to remote areas. It’s great for recharging your laptop or your camera batteries.

Powerbook with image browser
A professional laptop with an SSD hard disk is essential for processing the amounts of image data produced by modern, professional cameras shooting at up to 10 fps. If you don’t take the trouble to delete unusable photos and to sort your work every evening, you will most likely end up with too much data for processing and use at home.
2.1 Basic Camera Settings

In order to maximize your camera’s technical potential, you should usually set its exposure control system to matrix metering mode. Matrix metering compares the scene you are viewing with up to 20,000 sample scenes stored in the camera’s memory and ensures that blooming effects (washed-out highlights) are kept to a minimum. Matrix metering also ensures that the brightest parts of your image contain image data, even when you are shooting into backlight. This exposure mode also preserves the greatest possible tonal range and fine color gradation in your images. In 90 percent of all situations, matrix metering produces well-exposed images, or at least images that can be easily corrected later at the RAW processing stage.

In situations that matrix metering cannot cope with easily, you will need a lot of skill and experience to improve the final image at all. It’s best to concentrate on the most important part of the image and simply ignore the rest. Spot metering mode (with its very narrow metering angle) can help, but also requires great skill to be used effectively. With spot metering, you need to manually estimate the gray scale value of your main subject in order to prevent the camera from automatically selecting 18 percent gray, or “white minus 1 EV”. Then you must
estimate the result this value will have on other parts of your image. You can also use bracketing sequences in matrix mode or HDR techniques to improve exposure, although it has to be said that HDR is extremely difficult to apply to moving subjects.

As you become more experienced and develop your own technique, your choice of manual or automatic exposure metering will be based on the results you want to achieve. When you are starting out, it is advisable to use as few settings as possible that require continual monitoring. For this reason, I recommend shutter-priority auto, ideally combined with auto ISO (if your camera has this functionality). This way, you can limit motion blur in direct relation to the focal length of the lens. Auto ISO does, however, involve the risk of increasing image noise, especially if you cannot limit the values auto ISO sets.

Optimum image quality can be best achieved if you use manual exposure metering together with auto ISO and/or exposure compensation. This way, you can choose the ideal aperture and shutter speed for your particular subject and lens. This method can cause irretrievable overexposure if you select a shutter speed for a shaded subject which you then track into direct sunlight. Here too, auto ISO can cause significant image noise if you don’t limit its range in advance.

Using aperture-priority auto metering increases the risk of camera shake in changing light, and it can cause excessive motion blur in your image. You have to keep a careful eye on the settings selected automatically by the camera. Programmed auto mode is only really useful for shooting campfire photos after a glass or two of wine.

Your choice of lens should cover the safest focal length for your chosen scene, especially if you are using only one camera body and fixed focal length lenses. Swapping cameras in the few seconds a lion or cheetah hunt lasts is virtually impossible. “Safe” focal length here means that, if you can’t be sure your subject won’t overfill the frame due to a change in its direction of movement, you should select a shorter focal length. The 16-bit mode, RAW, and TIFF capabilities that most modern digital cameras offer make it possible to do very tight crops later on, but no image processing trick can replace the head of a lion that you have accidentally “cut off”.

Basic Camera Settings 21
2.2 Image File Formats

Even if you are using a beginner’s camera or a semi-professional model, you should still select RAW as your main shooting format if you have the option. RAW is the equivalent of a digital negative and allows you the most flexibility when making corrections to your images. The JPG image file format is roughly equivalent to an instant photo, and corrections made to JPG images nearly always result in a significant loss of image data.

You should only shoot in JPG format with a mid-range camera if you have to use the camera’s highest shooting speed and largest data buffer to avoid slowing the system down with RAW. Shooting directly in TIFF format will slow your camera down significantly and uses unnecessary memory capacity. Most RAW files can be converted automatically to JPG or TIFF using a batch process in an image browser such as ViewNX. Images shot under tricky lighting conditions should be presorted for further processing using more complex tools. This way, you can correct poorly exposed images by up to two f-stops, and save otherwise acceptable images from going to waste.

The superiority of the camera RAW format is especially clear when you are correcting blown-out highlights (or “blooming”) using Highlight Recovery, D-Lighting, or the Shadow/Highlight tool in Photoshop. When a JPG image is corrected, the exposure values for the highlights increase, and fine detail is simply lost.

If you shoot JPG or TIFF images directly in the camera, the camera processes the image data internally using a tonal value curve that increases image contrast according to the lighting present in the original scene. This increase in contrast, which is necessary to produce vibrant-looking images, reduces the dynamic range of the image data that the camera can capture by one full f-stop or more. If you shoot RAW images, this difference in dynamic range—the so-called “RAW headroom”—is preserved in the final image. Because the full dynamic range is present in the RAW file, you can then use a RAW converter to increase contrast and luminance and restore lost highlights and shadows without a further loss of image quality. The original RAW file is preserved during all corrections and remains saved as a separate file. All changes made to a RAW file only become irreversible once the image is saved as a JPG or TIFF file, and RAW originals can always be used to generate new versions of a corrected image.

The examples opposite illustrate the difference between a JPG image shot directly in the camera, a RAW image that uses its full “RAW headroom”, and the final version of a processed RAW image. The camera was set to “Vivid” while shooting the JPG image—the typical basic setting for producing bright, lively images.
JPG image shot directly in the camera. Due to the very high contrast in this scene, many of the highlights in the water and on the backs of the gnus are blown out. The dark portions to the left of the image, the animals’ faces, and the gnus’ flanks have also lost most of their detail. Changing the camera setting from “Vivid” to “Normal” or “Softer” would only have slightly improved this low-contrast image.

Non-processed RAW image downloaded directly from the camera. In order to preserve as much shadow and highlight detail as possible, I reduced contrast and saturation as far as possible while shooting. This produced a very low-contrast original, but preserved the camera’s entire dynamic range and the image file’s complete “RAW headroom”.

Corrected RAW image. Much more highlight and shadow detail is preserved than in the JPG image above. Post-processing using a RAW converter makes it possible to correct the image without losing highlight and shadow detail. Even the high degree of contrast and saturation adjustment that this image required hasn’t caused a significant loss of detail in the final image.
Shooting Images in JPG Format

In order to improve the quality of JPG images shot directly in the camera, you will often have to make corrections while you are shooting. Such corrections will influence the contrast and saturation settings, which in turn influence the brilliance of the final image. The softer (i.e., the more low-contrast) your scene, the more you will have to compensate by using the camera’s “Vivid” or “More vivid” settings. You should, however, always keep an eye on the image histogram when making this type of correction and, if necessary, set an exposure compensation value of between -0.3 and -0.5 EV in order to prevent the highlights from burning out. The converse is also true, and you should reduce contrast in-camera for high-contrast scenes, such as animals in water in bright sunlight. At first, the resulting images appear to be very dull, but they can be easily corrected using the contrast and saturation correction tools found in many high-quality image processing programs. This is the only way forward in such situations, as your camera will not be able to capture the full dynamic range of bright and dark tones in extreme lighting situations.

The Nikon D-Lighting function (usually called “higher dynamic range” or similar by other manufacturers) is a great help in such situations, but it can also produce images that cannot be enlarged easily due to increased shadow noise. Shadow noise takes on the form of visible borders between areas of differing color or gray tones. It can also cause a “posterization” effect, which produces blocks of non-matching, similar-colored pixels in the middle of enlarged portions of an image. For these reasons, shooting in camera RAW format is always the best choice. Today’s RAW converters are extremely user-friendly, even for hobby photographers who are not too technically-minded.

Shooting Images in RAW Format

In order to optimize RAW image files while shooting, you should only use as much exposure compensation as necessary to avoid burnt-out highlights (between -0.3 and -0.5 EV), or a loss of shadow detail (between +0.3 and +1.0 EV). Your camera will automatically capture the greatest possible dynamic range, and you should only attempt to make complex corrections while shooting if you are experienced enough to quickly interpret an image histogram and its relevance to post-processing.

Most RAW converters, such as Nikon Capture NX2 or Adobe Photoshop Lightroom, are capable of much more complex image processing than the electronics crammed into your camera body. If you find yourself shooting in a situation that lies outside your camera’s dynamic range, a three- or five-shot bracketing sequence shot at maximum motor drive speed is often a good workaround. At speeds of up to 10 frames per second (fps), a three-second scene such as “back-lit running lion” or “gnu jumping from riverbank” will usually yield enough material to produce a usable, correctable image.

D-Lighting and similar functions applied to RAW images work the same way as when they are applied to JPG images. Such settings can be deactivated later, but the image itself will be saved using a gradation curve optimized for the
D-Lighting tool, which in turn reduces the camera’s effective dynamic range. This type of in-camera correction tool certainly has its uses for press photographers, who need to produce highly-compressed images for fast transfer and immediate use. If, however, you are shooting for fine art printing or professional-level magazine purposes, you should always deactivate D-Lighting while shooting. You can apply the function later in a more controlled, data-preserving fashion during post-processing. Most images that require corrections to their dynamic range can be more effectively processed by combining exposure compensation with Photoshop Levels and masking techniques.

These three images illustrate a “blooming” effect (i.e., burnt-out highlights in an already slightly overexposed image). This effect occurs in high-contrast lighting situations that exceed the camera’s dynamic range. It can be reduced in JPG images by using a negative exposure compensation value, while RAW images that are overexposed by up to one f-stop (1 EV) can be easily corrected later at the post-processing stage.

Saving compressed JPG images is a destructive process. Each new “save” destroys additional image data. If you have to save your image as a JPG, for whatever reason, only do so once you have finished your processing.
2.3 Camera Dynamic Range

The photographer’s favorite enemy—limited dynamic range and contrast—can only be represented theoretically, as no film, digital camera, or printer paper can reproduce the actual range of image contrast that occurs in most real-world photographic situations. We don’t notice these limitations as long as the camera captures the brightest and darkest tones in our subject without losing too much detail. But, as soon as the dynamic range of a subject exceeds the dynamic range of the camera by two stops or more, these effects become immediately and painfully obvious. The illustrations on the following pages represent an image with a dynamic range that exceeds that of the camera (or theoretical film) by more than 2 EV, while the sample photos illustrate the corrective effects of exposure compensation or bracketing sequences. The upper gray areas in the graphs represent available light that cannot be captured by the camera, while the smaller gray areas above the colored bars represent the light that can be captured by the camera using various exposure settings or compensation values under the same lighting conditions. The result is always a compromise between shadow noise and lost highlight detail. Your chances of being able to rescue such JPG or TIFF images at the processing stage are significantly less than if you shoot allowing for the “RAW headroom” described earlier.

You can set the contrast-increasing “contrast” and “saturation” parameters for a RAW image to their lowest values either before shooting or later using a RAW converter. If you set these parameters in the camera, the histogram shows which additional tonal values are retained in the image, and the image will appear dull and very low-contrast in the camera monitor. Because the monitor is only capable of displaying JPG-quality images, the monitor image displays the camera’s full dynamic range but does not include the “RAW headroom”. You can now decide whether you would prefer to preserve shadow detail using a positive exposure compensation value, or whether you would prefer to preserve highlight detail (while sacrificing some shadow detail) using a negative value.

HDR techniques cannot be used for fast-moving subjects, but bracketing sequences can be effectively used to maximize your choice of source images for later processing. Bracketing often gives you more than 1 EV “rescue headroom”—a great aid during subsequent correction processes.
A. Exposing for the shadows

The shadows (S) are correctly exposed, the midtones (M) are too bright and are overexposed. Neutral gray (H) becomes white and is therefore overexposed. All the brighter parts of the image are completely burnt out.

The highlights in the foaming water show virtually no detail, the midtones are too bright, but the dark faces of the gnus (at least those in the foreground) are well depicted.

The histogram shows that the shadows (S) are only slightly clipped, but are already tending toward the midtones. The midtones (M) have shifted towards the highlights, and the highlights themselves (H) are irreversibly burnt out.

B. Exposing for the midtones

Dark gray (S) becomes black and is underexposed. The midtones (M) are correctly exposed. Bright gray (H) is white and overexposed. All the brighter parts of the image are also burnt out.

The highlights in the foaming water show virtually no detail, the midtones are OK, but the gnus' faces are too dark and show no detail.

Here, the shadow detail (S) can be partially recovered. The midtones (M) are OK, but the highlights (H) are nevertheless still lost.

C. Exposing for the highlights

Dark gray (S) becomes black and is underexposed. The midtones (M) are too dark and are underexposed. The highlights (H) are correctly exposed.

The highlights in the foaming water show adequate detail, but the midtones are much too dark, and the gnus' faces and other shadow areas show no detail at all.

Here, the shadow detail (S) is irreversibly clipped and therefore lost. The midtones (M) have shifted towards the shadows, but the highlights (H) are OK.
2.4 Image Histograms

Before we address the practicalities of shooting conditions in East Africa and the challenges these present, we need to take a look at the less exciting subject of image histograms. You can only really judge whether you need to correct your selected exposure values once you have evaluated some test shots of your scene.

The image histogram displays the distribution of tonal values in your image graphically and, more importantly, shows whether the exposure values lie within an acceptable range. We will address this second aspect here. You cannot rely on the image in the camera monitor to judge image quality, simply because the ambient light is too variable. So, even if you are not keen to learn photo-related physics, please take the time to check out our histogram examples. You will quickly learn that the worst type of everyday exposure error is overexposure, which leads to burnt-out highlights or “blooming”. Photographers who recommend always shooting with a “safety” compensation value of -0.3 or -0.5 EV only catapult their image quality back to that of a previous generation of digital cameras.

Burnt-out highlights can be displayed on most modern camera monitors using the “Clipped highlights” (or similar) function. But remember, your camera’s monitor is small and not very accurate. Say, for example, you shot your dream image of a running lion with its mane waving in the wind in early-morning backlight. Your monitor will probably display blinking clipped highlights over large parts of the image area, and your photographer’s heart will sink. However, a glance at the image histogram will show that the highlights are only very slightly clipped off to the right due to the thousands of (unimportant) dew-drops in the frame. Your image is, in reality, perfectly exposed, and even has a little “RAW headroom” in reserve.

The best approach is to test for yourself what degree of clipped highlights you are prepared to accept. Take a series of test shots of your subject at 1/3-stop compensation intervals and up to two stops total overexposure. If you then check the clipped highlights display in the image histogram and compare it with the appropriate image, you will quickly develop a feel for histogram curves and their relation to image exposure. Highlight recovery performed later using a RAW converter can only recreate detail for up to one stop of overexposure. Even if the highlight recovery slider in your program has a scale that covers, or even exceeds, two f-stops, this is usually not practically usable, and applying higher values only overlays overexposed areas with badly mixed color in your final image. Lost detail in the fine, white hairs on a lion’s nose cannot be recovered, and his whole nose will turn out gray if you try to overcompensate.

You will only end up with seriously burnt-out (i.e., glaringly overexposed) images on rare occasions when you are shooting directly into the sun or under very bright skies. Digital cameras are generally programmed to retain detail in the brightest parts of an image. Highlights only begin to burn out if the dynamic range of your subject exceeds that of the camera, making exposure...
compensation necessary. Overexposed images are often a result of incorrect use of the camera, too much flash, or inappropriate use of spot metering mode.

Every photo has its own unique histogram representing the distribution of tonal values within the image. Here, we will only address the basic differences between histogram curves. So, let’s get started interpreting this odd-looking display. Histograms often appear incomprehensible to the inexperienced eye, but, once understood, they are one of the best exposure aids available to the digital photographer.

The deeper you delve into the subject, the more you will find that the degree of automation promised by your camera manufacturer only holds true under perfect shooting conditions. Like nature and landscape photographers, wildlife photographers tend to shoot a large proportion of their photos in early morning sunlight and in the evening just before sunset. In order to produce well-exposed images under such high-contrast conditions, you often need to use precisely metered exposure compensation values. Landscape photographers often use bracketing sequences and HDR techniques to get the results they need, but as a wildlife photographer, you often have only one chance to capture a moment. Everything has to work perfectly right there and then.

Remember, even if you set your camera to RAW shooting mode, the camera monitor will display a simulated JPG-based image histogram. The “RAW headroom” described above will NOT be displayed. You can, however, find out just how much RAW headroom your camera has at camera review websites, such as dpreview.com. Today’s digital cameras (and especially the Nikon D3) expose very aggressively towards the highlight end of the tonal value curve, leading to the JPG-based histogram displaying a degree of recoverable highlight clipping that is not present in the original RAW image file. This causes photographers who are not aware of the “RAW headroom” phenomenon to constantly (and unnecessarily) use exposure compensation of up to 1 full stop (1 EV) when shooting with the Nikon D3. This behavior significantly reduces the usable dynamic range of this (and other) cameras. So: Know your RAW headroom!
In order to illustrate the point, I have used Photoshop to divide this image of a lion into three basic areas. We will ignore the visible part of the image during the following steps. If the midtones are not spoiled by incorrect camera settings or technical defects, they can nearly always be satisfactorily processed to correct image areas that are too bright, too dark, too dull (i.e., low-contrast), too brilliant (i.e., high-contrast), or that show color casts. These common errors can be addressed quickly and easily. For simplicity’s sake, we will discuss the yellow (highlight) and the red (shadow) portions of the image histogram.
Overexposure: The highlights are clipped right down to the midtones, and the histogram displays no shadow tones. The midtones are shifted to the highlight area of the curve, and shadow tones are displayed as midtones.

Underexposure: The shadows are heavily clipped, and the histogram shows virtually no highlight tones. The midtones are interpreted as shadows, and the highlights are shifted to the midtone area of the curve.

The same image, this time heavily overexposed. The yellow-colored areas appear snow-white in the actual image and are unusable.

The same image, this time heavily underexposed. The red-colored areas appear pitch black and without visible detail in the actual photo. This image is partially recoverable, but at the cost of increased noise in the recovered shadow areas.
The samples below are unprocessed RAW images that help to show the types of problems you might encounter while shooting. In an ideal world, you will be shooting under a slightly cloudy sky, as was the case in this portrait of a lioness. This type of light is easiest to handle, but it can produce slightly dull-looking results.

Early morning sunlight is much more intense, but this image of a gnu is already showing some signs of overexposed highlights in the dewdrops on the grass. This effect is visible to the right end of the histogram, in the narrow range where the highlight curve meets the axis. It is virtually impossible to use just the clipped highlights display to decide whether an image has been correctly exposed. Here, the display would probably show a degree of overexposure that would lead you to use negative exposure compensation, which would in turn cause an unnecessary loss of shadow detail.
The lighting in this photo of a hyena is more critical. The strong, lateral morning sunlight would cause uncontrollably high contrast if shot without exposure compensation. The histogram shows that exposure compensation of 1 EV would lead to the loss of only unimportant shadow detail under the vulture’s wings and the hyena’s nostrils. This would then make subsequent recovery of the highlight detail in the animal’s fur a relatively simple task.

In this image of drinking zebras, the reflections in the water cause the camera’s exposure meter to underexpose by one full stop in order to preserve highlight detail. Exposure compensation of +1 EV is necessary to preserve detail in the animals’ faces and other, brighter portions of the image. Again, it is often a good idea to take several test shots of a scene to determine which compensation value works best. Even photographers who are not technically-minded should know about the RAW headroom available for their camera, as this helps to determine how much apparently lost highlight detail can be recovered later.
This typical backlit situation is comparable with many tropical “monkeys in trees” situations. Such scenes always exceed the dynamic range of the camera. The camera’s exposure system automatically attempts to preserve as much highlight detail as possible, but will probably fail, even when using heavy underexposure. The only real solution is to use a high exposure compensation value of +2 EV or more, which will always cause the loss of some of the brightest detail in the sky. In this case, you can only expose the main subject adequately and preserve shadow detail by using exposure compensation or spot metering. Image #3 was corrected using a factor of +2 EV.

Generally speaking, it is correct to increase the contrast setting for hazy subjects, although this rule can differ if the sun is directly above your subject, or if your scene includes foaming water. This causes a loss of shadow or highlight detail for scenes that exceed your camera’s dynamic range. The ideal solution, as shown in thumbnail #3, is to set both contrast and saturation to their lowest possible levels, and to correct the image later. If possible, it is always preferable to make several test shots of tricky scenes.
Single, dominant colors often occur in photos of birds. In this case, the histogram no longer has a typical “mountain” shape, and a first glance could lead you to think that the image contains nearly no color at all. However, this is not the case—the dominant blue of the image simply doesn’t encompass many tonal values, and all of the other tonal values in the image are represented by the flat “foothills” of the histogram curve.

The greater the range of tonal values present in the dominant color, the broader the columns will be. Conversely, a dominant gray would only produce one column. Two similar sized columns often result from an incorrect white balance setting, or infer that the color represented probably cannot be reproduced in print.

Tones that are brighter than the dominant blue are displayed by the highlight curve (1). The three columns represent the blue base and color value crossover in the bird, while the darker tones are displayed in the “foothills” of the curve (3).

The high degree of magnification produced by long telephoto lenses often leads us to imagine that telephoto images are especially sharp. This is, however, not the case. A long telephoto lens increases the density of an image, causing the distances between individual animals, for example, to appear much shorter than they are in reality. In just the same way, a long lens also increases the density of dust and haze in your shot, which can lead to your image appearing blurred.

The image histogram can help here too. If the curve displays a dominant midtone “hump”, and shadow and highlight curves that don’t even approach the limits of the axis, you are most likely looking at an image that is hazy and/or blurred. The human eye compensates automatically for this type of haze, but a

Increasing contrast has made this image more vibrant, but not sharper. Additional sharpening doesn’t really help, either.

The highlight (1) and shadow detail (2) in the image histogram do not even approach the limits of the axis. The resulting empty spaces represent areas without any image information (i.e., without pixel values).
photographic lens cannot—at least, not for the visible parts of the electromagnetic spectrum.

2.5 The Camera’s Autofocus System

If set up correctly, modern autofocus systems are faster and more precise than the human eye. To function properly, contemporary systems require there to be significant differences in color between the subject and the background. (Older systems rely on visible differences in contrast within the frame.) You also have to let your camera know which part of the frame you are photographing. The direction of your aim is usually sufficient, but the correct choice of autofocus mode helps the camera to focus accurately. For example, a color-based 3D autofocus system cannot reliably track a beige-colored lion moving through beige-colored grass, and you would need to select Single-area AF autofocus mode in order to get good results. Conversely, Single-area AF does not make it easier for you to accurately track an approaching bird through a 500 mm or 600 mm lens. Here, you should use either Dynamic-area AF or 3D Focus Tracking mode. You can also use Matrix autofocus, which covers almost the entire frame; but it is often too slow, as it has to coordinate information from too many focus areas in too short a period of time to be really effective.

There are additional focus features which you can use, but they are often buried too deep within the camera’s menu tree to be quickly and easily selected or deselected while shooting. One such feature is “Lock-on AF”, which ensures that the autofocus system is not confused by blades of grass, tree stumps, or other foreground objects that might appear in the frame while you are tracking a moving subject. Lock-on AF can, however, also lead to blurred photos if your subject changes direction suddenly.

Another useful feature is the ability to combine focus priority and release priority autofocus modes, which ensures that the shutter can only be released if the subject is acceptably sharp from the outset. This feature doesn’t slow down autofocus significantly, but it can nevertheless cost you the relevant hundredth of a second when an attacking crocodile breaks water. This slight lag is especially relevant if you are not using ultra-fast, professional telephoto lenses, or if you are using lenses with maximum apertures smaller than f/4. Teleconverters can reduce the speed of your lens by up to 75 percent, which also slows down the camera’s autofocus system. Autofocus sensors begin to lose sensitivity at apertures of f/8 and less; if you are using such small apertures, you can only focus accurately by hand.

If you already have 10 great shots of your subject in the bag, deliberately modify your autofocus settings before you continue shooting. This way, you can find out exactly which settings best suit your personal technique. While experimenting, pay special attention to the “Lock-on” function and the combined Focus Priority/Release Priority setting.
You can only use the full potential of your camera’s autofocus system if you anticipate your subject’s movements. Just as in a football game, it is important to know where the ball is coming from, but it is critical to be able to predict where it is going to land. For a photographer it is even more important to know which route the ball is going to take. For example, 3D Tracking will have problems focusing on a beige-colored animal that moves from short, green grass into a dry, brown-colored landscape. Dynamic-area AF covering between 9 and 21 focus areas would be a better solution. If the path your subject takes includes bushes or low grass, even Single-area AF might work, but only if you are in a position to keep your subject fixed within one small focus area during the entire pan.

We will use the pictograms below to explain the practical examples in the chapters that follow. The color codes next to the sample images are applied according to the following criteria:

**Green**: Ideal setting  
**Yellow**: slightly less favorable alternative  
**Red**: unusable, or too slow for most situations  
**Two-color**: choose settings depending on your own technical preference  
**Half-color**: evaluate the surroundings and change settings if necessary

The pictograms represent the autofocus settings detailed below:

**Single-area AF**  
Very fast  
The focus areas can be accessed individually. The cross-type sensor in the center of the frame is the fastest and most sensitive. Applications: single-point subjects, or subjects whose movements can be accurately predicted and tracked. The ability to track focus areas manually makes this mode almost universally applicable when photographing birds.

**Dynamic-area AF**  
Fast  
A preselected set of focus areas reacts to the subject’s movements. Applications: Subjects whose movements cannot be easily predicted. This is a useful default setting that can be used to capture running cheetahs, leaping gnus, flying birds, and much more besides. Its functionality can, however, be easily disrupted by random foreground elements, such as grass or bushes.

**Autofocus with 3D Tracking**  
Fast  
The AF sensors automatically track the preselected subject using color-based information. Applications: Use as Dynamic-area AF. Results are often better, provided the subject’s color can be clearly differentiated from the color of the background. 3D Tracking is currently only available in professional and semi-professional cameras.

**Matrix Autofocus**  
Slow  
All focus areas react to potential subjects, including random objects that happen to be near to the camera. Applications: Use for subjects whose direction of movement is completely unpredictable (flying birds, for example). Use only where neither 3D Tracking nor Dynamic-area AF is available.
Chapter 3
Image Composition
3.1 Image Composition

Image composition in the wildlife arena follows the same basic rules that exist for other photographic genres or the world of painting. Perspective, the “rule of thirds”, lighting mood, color, and background are the basic elements that make up an image. A great photo is defined by its intensity and the emotions it evokes, and by the single, decisive moment it portrays. A running cheetah captured pin sharp using an ultra-short 1/8,000 second shutter speed makes a technically perfect shot, but it lacks the intensity that the same subject displays when photographed at 1/160 or 1/250 second while panning the camera. An animal portrait shot in passing can make a nice snapshot, but never equals the wonder of the moment you can capture if you observe your subject at length. Many animals only lose their timidity once you observe them quietly for long periods of time. You can then use their almost childlike curiosity to capture fascinating gestures and portraits. Some animals even pose, almost like models.

When you compose photos with a view to using them commercially, remember that the traditional 3:2 Leica format is no longer the worldwide print standard for books and magazines. Always leave a little “room for maneuver” when you frame your subject.
Successful wildlife photography is, of course, highly dependent on action. Events in the wild often develop so quickly that you do not have time to consider your composition or your zoom setting, and you frequently have to crop your images down to size later. You won’t always be able to shoot from the optimum viewpoint either, which limits the amount of control you have over perspective and the mood of the lighting. Always aim to get the best you can out of every given situation.

Wildlife photography is an intuitive subgenre within the field of photography. You need to develop your intuition not only for the technical side of your work, but also with respect to the animals you are photographing. Your learning curve will become less steep with increasing experience, although every time you try to increase the quality and intensity of your work you will find yourself facing invisible barriers that dampen your initial feelings of success. It is often necessary to spend years familiarizing yourself with animals and their environments, and your own body needs to adapt to new environments too. If you spend several months of the year for several years in the Antarctic, you will need time to adapt if you want to produce excellent photos in the tropical rainforests of Borneo.

This is why there is no “best wildlife photographer in the world”. Some of my colleagues are perhaps the best in their own specialized areas, but no one can claim to be the best in the entire animal kingdom.
3.2 The Rule of Thirds

The so-called “rule of thirds” (or “golden ratio”) is an effective image composition tool. In order to save ourselves the complicated math that artists have used since Renaissance times, we use the simpler method of dividing the frame vertically and horizontally into thirds. Important details—here, the lion’s eye—are then placed at one of the intersections (marked here with a circle).
Photos shot using the “rule of thirds” can be printed uncropped in landscape format, as a mirror image, or cropped in portrait format without losing their proportions. If you tip up this page of the book at 90 degrees, you will see that a “thirded” image can also be very effective when printed in a square format.

Black maned lion: Leader of the marsh pride, Masai Mara, September 2007, Nikon D2x, AF-S VR 200-400mm f/4 lens, ISO 220, 1/125 sec. at f4.0

The Lions of the Musiara Marsh

Try to keep potential future layouts in mind while shooting. The free space in the area the lion is looking towards makes this image ideal for text insertion. Always remember to leave enough space around your actual subject when composing your images, as the historically-based 3:2 format is no longer appropriate for most of today’s magazine and book formats.
3.3 Perspective

Image perspective is defined by the angle of view, subject distance, and camera angle relative to the subject. Along with subject placement, perspective is the single most important factor in the composition of an image. Always try to find the optimum, or even an extreme perspective for your wildlife photos. Photograph animals at “eye level” whenever possible; the side windows of your vehicle or topographic features such as hollows or gullies can help you find the right camera angle. If photographed from above (for instance, from the open sunroof of a jeep), many animals appear rather two-dimensional. If you must shoot from above, try to wait for your subject to raise its head, which helps to neutralize the negative effects of a raised viewpoint. Many wildlife photographic competitions are currently being won by photos shot from ground level using a remote control.

“Mohawk” lion:
Young lion in the Masai Mara, October 2005,
Nikon D2x, AF-S VR 200-400mm f/4 lens, ISO 100, 1/400 sec. at f4.2

Nile monitor lizard:
Masai Mara, September 2007,
Nikon D2x, AF-S VR 200-400mm f/4 lens, ISO 100, 1/250 sec. at f5.6

Long-tailed monkey with young:
Serengeti National Park, February 2006, Nikon D2x,
AF-S VR 200-400mm f/4 lens, ISO 100, 1/200 sec. at f5.0
It is important to use a straight perspective when photographing small animals. Oblique or overhead perspectives tend to make small creatures appear squat and unnatural.
3.4 Free Your Subject

The focus sensors in the center of the viewfinder of many modern autofocus cameras often tempt you to compose an image around the center of the frame. If you give your subject a little more freedom to move around within the frame, or to change the direction it is looking, the result is often a more interesting and/or dramatic image.

Pair of lappet-faced vultures: Masai Mara, October 2005, Nikon D2x, AF-S VR 200-400mm f/4 lens, ISO 100, 1/400 sec. at f/7.6

A slight change in composition can often turn a dull photo into a useful image.

Lioness on a lookout kopje: Serengeti National Park, June 2005, Nikon D2x, AF-S VR 200-400mm f/4 lens, ISO 100, 1/400 sec. at f/5.0
3.5 Cropping Images

Wildlife photography often involves heavy cropping. This can be the case if the focal length you are using doesn’t produce the result you were planning, or if you can’t pan your camera far enough, or if you simply can’t get near enough to your subject. Fortunately, today’s cameras have significant reserves of resolution, allowing you to make generous use of your digital scissors during post-processing. Don’t be afraid to crop your images to get the results you require. The example below still contains approximately six megapixels of image data, which is quite enough for an A4 magazine page or an A3 digital print. For reasons that I don’t understand, images that are cropped by more than 15 to 20 percent don’t seem to win competitions and are sometimes not even allowed entry. If you use a Nikon full-frame camera, you can avoid this Catch-22 situation simply by switching to DX format, allowing you to fight nonsense with nonsense until the rules get changed.

River crossing:

Herd of gnus in the Mara River, Masai Mara, September 2007, Nikon D2x, AF-S VR 200-400mm f/4 lens with 1.4x teleconverter, ISO 360, 1/500 sec. at f5.6
3.6 Animal Portraits

A great animal portrait should be well composed and punchy, while still portraying the character of the animal itself. Portraits, however, also live from the intensity of the moment and shouldn’t be afraid to shock. The close-up technique used here (with the subject less than 30 feet away) intensifies the effect of the image. Shooting this type of image can nevertheless be dangerous, even if you are working inside a vehicle, and should only be risked by photographers who are experienced in dealing with predators. Sharp, in-focus eyes are an absolute necessity in this type of shot, and you should immediately send all shots which aren’t up to the mark to the great digital graveyard in the sky.

Unlike other fields of nature and landscape photography, we only need to address the “bokeh” aspect of depth-of-field for the background when shooting wildlife photos. The typical shooting distances that result from the use of long telephoto lenses produce a phenomenon that could be best called “shallowness-of-field”, as the depth of focus involved ranges between a few inches and about three feet.

The wider you set your aperture, the more your subject will stand out from its background, but you should nevertheless select an aperture that keeps other relevant details in focus. If your shutter speed is fast enough, switch off any image stabilization (VR or IS) lens functionality in order to keep your background as smooth and uncluttered as possible. If you leave your image stabilizer switched on, the oscillating lens elements and camera sensors can cause out-of-focus background objects to be duplicated in the final image.
The right lighting (here, golden evening light) is very important to the success of an animal portrait, and it is worth waiting for the right moment. The blades of grass around the lioness’s neck and body spoil this otherwise perfect image.

Wait until your subject loses its timidity. Even hyenas, which are generally thought to be “ugly” creatures, can pull funny poses if you let them. You simply have to be patient and wait for the right moment.
3.7 Panning the Camera

If you want to take sharp photos of running animals, you can avoid unnecessary motion blur by following your subject’s movement with the camera. If you then increase your shutter speed to $\frac{1}{30}$ second or longer, the result is often a dramatic pan- or blur-effect image. If you do use blur effects, always make sure that your subject is still recognizable. The high running speeds that cheetahs can reach make them ideal subjects for panning shots, although running cheetah shots are 10-a-penny at most photo agencies and are freely available on the Internet. One reason for this ubiquity is that earlier slide films were seldom light-sensitive enough to accommodate ultra-short shutter speeds necessary for fast-moving subjects.

If you want to switch from movement-freezing, ultra-short shutter speeds to the longer shutter speeds suitable for blur effects during a shoot, set your shutter speed dial increment (EV Step) to full f-stop clicks. You then only need to note the number of clicks (for example, between $\frac{1}{4000}$ second and $\frac{1}{30}$ second), allowing you to make the change without moving your eye away from the viewfinder. The default $\frac{1}{3}$-stop EV Step setting makes switching from fast to slow too time-consuming. The safest way to bag your shot is to decide in advance whether you want to use a short shutter speed to freeze the action, or a longer shutter speed to create motion blur.
Successful use of panning techniques requires a lot of practice. The best way to gain experience is simply to continue shooting while increasing your shutter speed once you have your planned shot in the bag. If you have time, try increasing your shutter speed right up to $\frac{1}{8}$ second. The running gnus in the photo above show the amount of motion blur that a $\frac{1}{15}$ second shutter speed produces.

The photo of the running lioness clearly demonstrates the necessity of panning for moving subjects, even when using a short (here $\frac{1}{320}$ second) shutter speed. If I hadn’t panned during this shot, the grass would have been in focus, but the lioness would have been blurred.
3.8 Reportage Photography

Complete reportage stories (or “sequences”, as they are called by the agencies) are a great additional format for marketing your wildlife images.

Sequences can be sold best if they tell a short, complete story that is of interest to specialist magazines. Always label sequences as sequences, and include a description of the action.

Reportage stories should come across as complex and interesting sequences of events, rather than as a number of individual, well-exposed images. A sequence doesn’t always have to cover a complete hunt from beginning to end, as this requires patience, intuition, advanced study of an animal’s behavior, and luck. There are many other, more compact scenarios that sell well if they have been well photographed and tell a gripping story. A good reportage sequence documents a story graphically and includes an overview as well as details of the action.

If you find yourself watching a “one-in-a-million” hunting scene like this one, decide quickly whether you have time to swap cameras or change a lens during the action. It helps to have two camera bodies ready with medium and long telephoto lenses mounted. Some photographers even have a third camera body with a wide-angle zoom continually ready for action. And, unless you are a really cool operator, increase your shutter speed a little while shooting this type of scene—the emotions evoked are sure to cause your body to produce some excess adrenalin and some camera shake to go with it.
3.9 HDR and Panorama Stitching Techniques

Both of these techniques involve combining multiple exposures into a single image using image processing tools. They offer huge creative potential, but the complexity of the processes and the specialized software they require are beyond the scope of this book. The following is a brief description of the basic techniques involved.

HDR (High Dynamic Range) techniques help us in our battle against the photographer’s old archenemy: limited sensor (or film) dynamic range. Although this technique is normally applied to non-moving subjects photographed from a tripod, it can also be used effectively for slow-moving subjects photographed with a fast motor drive. The photos in our sample sequence were shot in seven increments between -1 EV and +5 EV; the slight movements of the animals between shots were corrected later using other image processing tools.

Applied correctly, digital photographic techniques are vastly superior to analog techniques for this type of application. You can use HDR techniques to virtually double your camera’s dynamic range. In the analog world, you can use gradation filters to (more or less) invisibly extend your range by up to 4 EV.
Stitching (or “merging”) techniques are used to produce images with higher resolution and more detail than you could usually achieve in a single image. Panoramas are best shot using a tripod and a specialized panorama head; the technique can be applied in a wildlife context in combination with a fast motor drive. Merging the resulting images (see the example below) is a complex process, and the automatic merging tools built into Photoshop or other image processing programs are not always an effective solution. The animals that appear in the overlaps between shots must fit together perfectly from the outset or be appropriately retouched.

Source images for stitching applications need to be identically exposed, and are therefore best taken using fixed or manually selected exposure and white balance values. In order to keep vignetting to a minimum, close down your aperture by at least two stops while shooting. The more source images you shoot, the better chance you have of achieving a perfect fit at the merging stage. There is a mass of specialist literature available on these subjects for those of you who want to delve a little deeper, with some of the better examples coming from the publisher of this book.

Cropping a single 12-megapixel image to produce an image in this format would leave only 3.5 megapixels of image data. This panorama image consists of four 12-megapixel photos, and the resulting 48-megapixel image can be enlarged to a length of over six feet without losing detail.
Chapter 4
Planning Your Trip
4.1 The Right Place at the Right Time

This is the most important topic in this book. We will use this chapter to address the timeframe for events within the Serengeti ecosystem step by step. But how should you go about photographing something very specific, such as an animal that you have seen illustrated in a magazine? Independent of what or where, the approach is always the same. The first step is to find out if anyone you know has specialized knowledge of your chosen subject—although some wildlife photographers do like to keep their exact locations secret. The next step is to do some library or Internet research, and if you find a relevant website, don’t be afraid to email the author for assistance. I have received a lot of help this way on my Asian tours; one Asian photographer had a good laugh when I confessed that my tour operator had recommended that I photograph primates in the Borneo rainforest during the dry season. Photographing orangutans as they dance through the treetops against a clear, bright sky would have been impossible, and my photographer friend immediately told me the best time of year to go: when there is little rain and the skies are cloudy. So you see—good information is extremely important when you are planning a trip.

The most time-consuming way to find your subject is to note any distinct characteristics that you can see in the original photo and then to search the most likely area gridwise on the ground—a method I have often used myself. I had seen the place illustrated in the small photo at top right years ago in a book (albeit with fewer gnus at the riverbank), but I only found and photographed the same place myself in 2005. Most organized tours stick to the region of the Masai Mara on the eastern side of the Mara River because there are usually more animals there. Very few drivers choose routes that take you south to the other side of the Masai Mara, in part because this area also has an additional US$60 daily entrance fee. My driver and I searched the Mara river from end to end until we found the place I was looking for in the southeastern Masai Mara, and we were immediately rewarded for our efforts by a herd of gnus crossing the river.

With a few notable exceptions, don’t rely on information from tour operators when planning your trip. They tend to recommend the time of year with the best weather for a trip, which often doesn’t coincide with the best time of year for photographing wildlife. This is especially true in the Arctic and Antarctic regions. Many of nature’s most compelling spectacles do not occur in the tourist season at the earth’s poles, and you will probably need to take part in an expensive ice-breaker trip if you really want to get the best polar wildlife images. Wherever in the world you want to photograph your chosen subject, the quality of your advance information will determine the quality of the images you bring home.
In the following chapters, this symbol tells you best time of year for photographing the most interesting events in the indicated region within the Serengeti ecosystem. Most regions can also be visited at other times of year but will provide you with less exciting subject matter.
4.2 The Serengeti Ecosystem

The Serengeti is one of the largest and best known nature reserves in the world. Not only the diversity, but also the sheer number of animals that live there—especially the enormous herds of ungulates—make the area a unique spectacle for nature lovers and wildlife photographers alike. And where huge herds of potential prey are underway, predators are never far behind. The basis of the entire ecosystem are the annual ungulate migrations, and the gnus especially cover enormous distances on their continual search for fresh and varied grass.

Gnus and zebras migrate in single lines that often stretch from one horizon to the other. During these migrations, herds of up to 100,000 animals collect at water holes, fords, and places where the grass is still fresh. The total gnu population is estimated at around two million, half of which are continually on the move. These animals not only graze the ecosystem, but also revitalize it with millions of tons of natural fertilizer, which is in turn distributed over a wide area by dung beetles. Such huge numbers of grazing animals and the thousands of predators that live off them could tempt you to think that you can find large numbers of wild animals at any time of year, anywhere in the region. This is, however, not the case.

The Serengeti itself is about 125 miles wide from east to west, and about 112 miles long from north to south. But the animals don’t, of course, always move within the borders of the Serengeti National Park or the Masai Mara. If you go on a “standard” safari, you are sure to see a lot of wild animals, but the real spectacle and drama play out at very specific times of year in a relatively limited geographic area, which can be many miles from the locations chosen (often randomly) by tour operators. It can also be difficult to persuade the five or six strangers in your jeep to spend hours driving with you to the specific area you want to visit.

The best way to create optimum conditions for wildlife photography (including optimizing vehicle space) is to organize your own private tour, if possible with a maximum of two like-minded colleagues. Here, we will describe a whole year’s migratory patterns, helping to ensure that you are “in the right place at the right time”, and thus also helping you to maximize your safari experience and your crop of images.

The annual migrations begin after the massed birth of gnu calves (in the Ngorongoro Crater and in the South Serengeti) after the start of the short rainy season in January/February. We will begin our journey in the Ngorongoro Conservation Area and the South Serengeti as the gnu births begin. Both of these areas remain interesting for us right up to the beginning of the rainy season in April. The massed gnu births are a truly unique natural spectacle, but the hundreds of thousands of calves that are born within just a few weeks also attract many predators to the area. From the moment they are born, newborn calves become the prey of big cats, hyenas, jackals, and other carnivores, and only the sheer number of young prevents the species from being wiped out. About two-thirds of all newborn gnus survive each year. This sometimes nightmarish
The Serengeti ecosystem covers an area of nearly 11,600 square miles between the eastern bank of Lake Victoria and the Ngorongoro Crater in Tanzania. The northernmost part of the Serengeti, the Masai Mara, lies within Kenya. The central Serengeti National Park covers an area of nearly 5,800 square miles, while the Masai Mara in Kenya covers approximately 650 square miles.

* The running gnu symbol charts the annual migratory routes of the major ungulate herds.

Illustration © Uwe Skrzypczak
spectacle can be upsetting for the sensitive (especially children), and it might be advisable to travel at a different time of year if you feel this applies to you.

In May, at the end of the rainy season, bull gnus in the South and Central Serengeti fight for their right to mate. In order to secure their harems, the bull gnus go through bitter but often comical-looking battles. The presence of the gnu herds at this time also attracts predators. At the beginning of June, as the dry season progresses, the gnus begin gathering in earnest in the South and Central Serengeti. Once the famous “Moru Crush” is over, the Moru region sees the start of the “Great Migration”. The herds divide into a central phalanx that moves northward through the Central Serengeti toward the Masai Mara in Kenya, and a western phalanx that moves through the Western Corridor towards the Grumeti River, just 20 miles from Lake Victoria. The herds crossing the Grumeti River in the Kirawira region are eagerly awaited by the largest African crocodiles, who get to eat their single biggest meal of the year during the Great Migration.

The herds then move further north towards the Masai Mara during July. This is when the extreme dry season begins, and your chances of spotting large numbers of animals (and with them your photo opportunities) become less with every passing day. This is why I prefer to wait for the gnu, zebra, and gazelle herds to arrive in the Kenyan Masai Mara in August. The Masai Mara Nature Reserve in the North Serengeti has one of the densest predator populations of all wildlife reserves on the planet, and these predators can only survive thanks to the year-round presence of the ungulates and warthogs that make up their diet. The Mara river (which never runs dry), with its large numbers of crocodiles and hippos, is the main source of life in the region, and additional evening and

The timings mentioned in the text can vary by as much as two weeks for climatic or other scientifically inexplicable reasons. The appendix includes links to various East African websites that update their climate data on a regular basis.
night rains are precipitated by nearby Lake Victoria. Apart from its predators, the Masai Mara's main attraction is the arrival from July onwards of the massed ungulates migrating from the Serengeti. The river crossings of up to 100,000 animals are one of the most breathtaking natural spectacles our planet has to offer, and it is for good reason that the Great Migration is counted among the “New Seven Wonders of the World”.

A journey through the Serengeti is also a journey back to the origins of the human race. The area in and around the Great Rift Valley is considered by many scientists to be the cradle of humankind. On the way to the Serengeti National Park, you pass the Olduvai Gorge where Louis Leakey excavated early human remains in the 1950s. The Serengeti region is of volcanic origin and is geologically relatively young at a mere 100 million years old. The volcanoes of the East African Rift (which includes the Ngorongoro Crater) showered the Serengeti with volcanic ash for millions of years, producing the vast, flat savannahs of the East and South Serengeti. These areas are covered with the nourishing, calcium-rich grasses that help great herds of ungulate mothers produce enough milk to feed their newborn young.
4.3 Preparing to Travel and Conditions on the Road

Traveling in tropical environments always involves health risks. This is also true in the Serengeti, although the higher altitude makes the climate relatively pleasant. Check with your physician well in advance to make sure you are fit enough to acclimatize to the region. Also make sure that you are well informed about all necessary precautionary measures and inoculations before you leave. Inoculations against hepatitis A and B, yellow fever, polio, rabies, tetanus, and meningitis are recommended. Most of these inoculations need to be refreshed at specific intervals. I also recommend taking prophylactic malaria medication—the best tablets currently available are Malarone, which have very few side-effects but are unfortunately expensive. You should, of course, also pack a sufficient amount of any prescription medications you need. If you are prone to infections, take a strong broad-spectrum antibiotic along too.

Some form of antidote to bacterial gastrointestinal infections is also highly recommended. Foreign bacteria that our bodies are not used to are more often the cause of stomach infections than the famous “unwashed lettuce”, especially for people visiting Africa for the first time. Africans in Europe have to deal with similar problems when acclimatizing to a foreign diet. If you are planning an extended stay in Africa, or if you are planning regular trips, make sure your health insurance covers the “Flying Doctor” service. If you tend to travel often and/or spontaneously in the tropics, make sure that all of your prescribed inoculations are automatically refreshed at the appropriate intervals. This way, you are always ready to board the next plane without having to visit a doctor first.

Travelling in Kenya and Tanzania is generally no more dangerous than driving at home, but these are still developing countries with a relatively high crime rate, especially in the urban centers of larger cities. Keep a careful eye on your baggage and photo equipment, especially at airports. Never give your baggage to someone who claims to be a porter—the driver hired by your tour operator or your lodge will look after your baggage. Insure your photo gear against theft, loss, and breakage, although the risk of theft at most lodges is extremely low, even if they don’t have a safe.

As of this writing, the following are some of the travel options for a Serengeti safari. There are daily direct flights from Amsterdam, Netherlands (AMS) to Kilimanjaro, Tanzania (JRO) on KLM Royal Dutch Airlines. The return flights are overnight with a stop in Dar Es Salaam, Tanzania (DAR). There are also departures every Tuesday on budget carrier Condor Airlines from Frankfurt, Germany (FRA). The outbound Condor flight is overnight; therefore, when you arrive in the morning at the Kilimanjaro airport you can get a head start directly into the Serengeti ecosystem. The return flight is during the day and requires a stop in Mombasa, Kenya (MBA). On Condor Airlines there is “premium economy class”, which is between coach and the expensive first-class, that provides more comfort. If you have not booked a connecting inland flight to your final destination, the next stage of your journey will be a 125-mile jeep ride on tarred roads along the banks of Lake Manyara towards the Ngorongoro Crater. Above the crater
you will find not only the burial site of the famous German naturalist Bernhard Grzimek and his son Michael, but also a number of attractive lookout points with views into the crater. The Serena Lodge at the edge of the crater (about four hours’ drive from the airport) offers an excellent lunch for about US$15. If you have not planned to stay in the crater area, you will carry on from here to the Ngorongoro Conservation Area, which is where the massed ungulate births take place in January and February.

Spending time in or simply travelling through this area currently costs US$60 per person per day. The Serengeti National Park (where the entrance fee is also currently US$60 per day) is another one-and-a-half hours drive away along dirt roads. Depending on which area you are visiting and which lodge you are staying in, it can take another two or three hours to actually reach your final destination.

If you are heading to the Masai Mara in the North Serengeti, fly into Jomo Kenyatta airport in Nairobi. There you can connect to the Wilson Inland Airport by car and then fly for about an hour to the Masai Mara in a small turboprop airplane. The jeep drive into the Rift Valley in the Masai Mara takes between four and six hours, depending on the weather conditions. You can also reach the Masai Mara by way of a two-and-a-half hour inland flight from Mombasa, or by jeep. The overland route takes between 10 and 12 hours and is only possible in the dry season. The current entrance fee in the Masai Mara is US$60 per person per day.
You should obtain a current entry visa for Kenya and Tanzania in advance of traveling, as this saves valuable time at passport control on arrival and reduces the risk of missing your connecting flight. A three-month tourist visa costs US$50 in Tanzania and US$25 in Kenya. Your movements in Africa will depend on the specific areas you want to visit and what you want to photograph. Standard safaris generally leave for the nearest nature reserve every two or three days, but lose a lot of time due to long outward and return journeys. If you are serious about your wildlife photography, a privately organized tour is a much better way to get around. With the exception of a few rainy season bargains, organizing your own itinerary is often only slightly more expensive than most organized tours.

Every wildlife photographer’s basic mode of transport is a jeep or Land Rover. You will usually have to share a jeep with up to five other people, but if you want to improve your working conditions, you can arrange to share with one or two others. This is the only way to make sure that your daily timetable runs according to your own schedule, and the additional cost is minimal compared to the advantages you gain from being able to use your vehicle how you want. It is often easier (and cheaper) to plan a private tour once you are in Africa, and you will find some useful East African addresses in the appendix.

If you are planning to visit several nature reserves along your route, you will be met at your destination airport or at your hotel by your driver/guide. If you are only visiting a single destination and have booked just one lodge, it is often simpler to fly direct. Most lodges have their own vehicles and drivers with good local knowledge, and some of the vehicles are even customized for use by photographers and camera teams. The private use of a vehicle and driver can,
however, cost as much as US$250 extra per day, and is not always possible in
the high season. Even if everything seems to be booked out, your tour operator
should be able to organize a vehicle and driver for you.

The level of your driver’s experience is important to the success of your wild-
life photography. A driver should not only know his way around the area, but
also have extensive knowledge of the indigenous animals and their behavior.
Wild animals are nearly always on the move, and your driver should be moti-
vated enough to put up with long drives while following your chosen subject.
A good driver expects to be tipped US$15-20 per day, and tips go a lot further
towards feeding a driver’s family than his basic salary. Taking an evening meal
with your driver now and again is a also good way to ensure that he keeps up
his good work. Remember, you are a guest in Africa. Respect its people, and
help to protect the environment that all Africans respect in spite of the some-
times extreme poverty that predominates in many areas.
4.4 Where to Stay

The most common accommodations in the Serengeti are “tented camps”. Luxury tents are often 400 square feet or more, and are equipped with bathrooms, showers, and huge, comfortable beds.

There are also good, middle-range lodges available. Basic lodges have simple tents and shared outside bathrooms and showers. The development of African tourism has also led to the appearance of brick or concrete lodges, but these have a less authentic feel than the traditional camps. The first few nights in a tent can be unnerving, but once you get used to the wonderful sounds and smells of the African night, you won’t want to sleep any other way.

Some camps have recently begun to erect electric fences around their perimeters. This is not an environmentally friendly thing to do, and it also means that you no longer have the chance to shoo away a herd of buffalo or elephants before leaving your tent in the morning. Most lodges and camps are located directly within the animals’ habitat and are guarded by Masai warriors. After nightfall, a Masai will always escort you to the campfire or restaurant, and for your own safety, you shouldn’t wander around unaccompanied. The food and general level of service in most lodges are very good indeed, and the staff are generally friendly and helpful. A lack of water is often a problem, so try to avoid
taking long showers. Those with more wilderness experience can also make use of simpler camps and campsites, and take a break for a day or two in a higher-class lodge when limited personal hygiene gets to be a strain.

If you set out before sunrise or plan to spend the whole day on the road, you will be given breakfast- and lunch-boxes by your lodge, and it is important to always carry enough to drink in your vehicle. The climate in the Serengeti is pleasant, with daytime temperatures reaching between 73°F and 82°F in the shade. Night temperatures range between 54°F and 64°F, depending on the season. The coolest temperatures are in June and July. However, the savannah regions provide virtually no shade and daytime temperatures often reach as high as 105°F. Always wear a hat and sunglasses, and follow the example of the animals you are photographing by taking a long siesta in the midday heat. The Ngorongoro Crater Highlands are an exception: nighttime temperatures at the crater rim (over 7,000 feet) can be as low as 50°F. The floor of the crater lies more than 2,000 feet lower, and temperatures there are much warmer.

The midday temperatures tempt many tourists to wear shorts and flip-flops, but remember, if you are not a regular visitor to Africa, you will not be acclimatized to the local conditions. You should generally always wear sturdy, closed shoes and long trousers, especially during picnics or on visits to the “bush bathroom”. The collected smells of a day in the bush are quickly forgotten after an evening shower.

The risk of accidents involving animals is very low on safari and at lodges, and most of the accidents that do occur are due to simple tourist high spirits. Most wild animals always keep a safe distance from humans, or simply flee, and things only become dangerous if you get too near an animal while you are outside your tent or vehicle. With the exception of (almost prehistoric) crocodiles, who will eat anything they can get their jaws on, humans are not part of the normal diet for African predators. You should nevertheless avoid trying to prove the theory by stroking a lion. Most accidents among local people involve hippos, which tend to react aggressively when disturbed, especially while eating. Horrific movie scenes involving poisonous snakes are not realistic, and you will hardly ever see a snake in Africa. If you should be confronted by a snake, keep your distance. Without specific knowledge of the species, it is difficult to judge how quickly a snake can move when attacking or retreating. The best approach is simply to avoid all risks for your entire stay in this unfamiliar environment.
4.5 Daily Routine

You should adjust your daily routine to suit that of the animals you are photographing. Most animal activity takes place in the early morning and late afternoon. Unusual daily rhythms mean that you will often miss out on the regular meals that other tourists are served at their lodges, so you will only be able to spend your time this way if you travel alone or with like-minded photographers. Your day will start with a wake-up call and tea or coffee at around 5 a.m., and you should set out at around 6 a.m. to get into position near your subject before sunrise. Your first “targets” will probably be lions or leopards, as both of these big cats hunt into the early morning if they haven’t already eaten their fill during the night. Around 9:30 a.m. is time for a bush breakfast, either inside or outside the car, depending on your surroundings. If some nearby animal action occurs during your meal, you will probably have to collect the remains of your food from all around your vehicle afterwards!

Your next subjects will probably be daytime hunters, such as cheetahs. In some areas, cheetahs have already learned to hunt at the times when humans are taking a break in order to avoid being disturbed. You will most probably be on a constant lookout for other spectacular events; you can sometimes find lions and leopards hunting in the daytime, as both tend to hunt whenever an opportunity for a catch arises.

As of around 12:30 p.m., depending on the heat and the level of animal activity, it is time for a one- or two-hour lunch picnic, which is best enjoyed in the shade of a tree. If you are taking a break in the open, sit back-to-back with your driver or companion, so that you have a better overview of your surroundings and can react quickly if you need to get back in your vehicle. A short nap in your jeep after a meal is never a bad idea, as your working day will probably only end once you have sorted your day’s photos following an 18-hour shift. Wild animals are always less active in the afternoons until it gets a little cooler, around 4:30 p.m. This is when the famous “golden light” of the early African evening sets in, and it is once again time to look for lions and leopards to photograph while they hunt for their dinner. Once the sun has set, you can head back to camp. A shower, a sundowner at the campfire, supper, and then camera maintenance and image selection make up the evening’s activity until you collapse into bed—so tired that you probably wouldn’t notice if you had to share your tent with a lion. If you are traveling with a partner, you might occasionally be reminded that life
also consists of things that have nothing to do with wildlife photography, and which can sometimes make early starts a little more complicated.

During the day, the “bush bathroom” is your only hygiene option, and you should always follow your guide’s instructions during breaks, especially in unfamiliar territory. Always remain within the shade of your vehicle, and never wander off into the bush or too near a riverbank. Never leave your vehicle when leopards are around, or when you are following leopards. If you are inexperienced, it is quite possible to simply overlook these big cats in high grass or in the bush at distances of three feet or less. A leopard will run away from humans that it spots at a distance, but it can be very dangerous if surprised close up. And don’t get lulled into a false sense of security by the apparent inactivity of animals surrounding your vehicle. You should always make sure you are at a safe distance from any predators before you leave your vehicle, as many of these creatures can reach running speeds of up to 45 mph in a matter of seconds.

Our jeeps are our photographers’ “cloak of invisibility”, but they are used by some cheetahs as lookout posts while hunting. Leaving your vehicle in cheetah territory causes the animals to flee, and often to lose their prey, or even their young. You should only make use of the “bush bathroom” if any nursing cheetahs in the area cannot see you. Otherwise, a cheetah mother will hide her young or chase them off in various directions, which then endangers the young animals’ lives.
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The Light in East Africa

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The Light in East Africa
5.1 Morning Light

The photos on the following pages illustrate the typical lighting situations that you are likely to encounter during the course of a day in the Serengeti. The extremely high contrast produced by light near the equator will often overstretch your camera’s dynamic range. The light in the Serengeti is generally easiest to deal with when the sky is completely covered with light clouds, although this can lead to rather dull-looking images in which the subject merges with the background. However, most days in the Serengeti are sunny and can be divided into the three basic time periods found all over the world: morning light, daylight, and evening light.

The morning light phase begins at sunrise and is typified by the extremely high contrast produced by the low sun.
This stark light quickly becomes more diffuse but nevertheless continues to produce strong shadows. As the air temperature increases, the dew on the grass begins to evaporate, making the light softer and more hazy. This light is ideal for taking backlit or sidelit photos. At this time, you can generally control the exposure enough to prevent all but the most insignificant highlights from burning out and losing detail.
5.2 Daylight

Between 9 a.m. and 10 a.m., depending on your location and the time of year, the morning sun gives way to the distinctly less interesting daylight phase. The steep angle of the incident light causes the faces of animals to appear almost two-dimensional while still producing strong shadows on the ground.

With a little patience, you can learn to make the most of daylight situations. Many wildlife photographers don’t even bother shooting during the daylight phase. I see wildlife photography as a primarily documentary form, and some types of behavior can only be documented under less than perfect lighting conditions.

Motion blur:
Lion fighting flies,
Masai Mara, November 2005,
Nikon D2x, AF-S VR 200-400mm f/4
lens, ISO 100, 1/80 sec. at f/8.0
Photos of animals in water are very difficult to expose correctly in bright sunlight, especially at shadowy riverbanks. Passing clouds can help, but can also reduce the amount of available light by as much as four stops (4 EV), making the use of long telephoto lenses with short shutter speeds extremely difficult. From midday onwards in the dry season, the light begins to flicker and produces distinctive mirages, reducing the range of most telephoto lenses to under 100 yards. The range of focus up to infinity that you are used to using at home simply ceases to exist under these circumstances. Dust in the air can also cause mirages to mutate further into completely unusable “fata morgana”.
5.3 Evening Light

As it gets cooler towards evening (from about 4:30 p.m. onwards), the much warmer evening light sets in and gradually turns into the famous East African “golden light”.

This is the best time for shooting “postcard” photos with highly saturated colors. The richness of these evening colors can only be beaten by the well-known and often dramatic East African sunsets, which are often accentuated by the slight underexposure that many cameras automatically produce when shooting into the light.

This phase ends just before sunset with a short period of extremely high contrast caused by the low sun. It is then only a few minutes until nightfall.
Chapter 6
The Ngorongoro Crater
6.1 The Ngorongoro Crater—Wildlife Paradise on Earth

If you are the sentimental sort, or if you tend to be sensitive or emotional, then you should not visit the Ngorongoro Crater in June. At the point where you break through the clouds about halfway down the 2,000-foot crater wall during your cold, early-morning drive to the crater floor, the sight is guaranteed to take your breath away and to bring tears to your eyes. The image of peacefully grazing herds in the first rays of sun will burn itself into your soul for ever.

The price for a short stay in this earthly paradise is high. In addition to the cost of your lodge and driver (about US$600–800), you will have to pay a US$60 per person entrance fee and about US$200 for your vehicle. This equates to about US$170 per hour for a six-hour, one-day stay. These prices are squarely aimed at reducing mass tourism in the crater, but they haven’t yet achieved their aim.

The high prices mean that increasingly few professional wildlife photographers spend time in the crater, although the work of these professionals is largely responsible for the thousands of enthusiasts who are prepared to pay the asking price for this unique experience.

The Ngorongoro Crater isn’t actually a crater, but rather the caldera of a collapsed volcano. The 100-square-mile crater floor infers that, before its collapse, the original volcano was of similar size to Mount Kilimanjaro—the highest mountain in Africa at 19,340 feet. The crater floor is around 5,600 feet above sea level, and the crater walls stretch another 1,500 to 2,000 feet higher. Once you
are in the crater, it feels like you are visiting a kind of “Little Africa”. The crater’s micro-environments include savannah, bush, woods, and even its own Lake Magadi, and the approximately 20,000 animals that live there include all of the major African predators. The animals could leave the crater via various passes if they wanted, but the year-round availability of food and water means they seldom do. The altitude means that the crater is often cloudy, and the amount of rainfall is consequently greater than in other areas of the Serengeti. This in turn means that the crater is populated at certain times of year by animals that usually live elsewhere. Lions are generally lazy and tend not to move more than they have to, so the year-round availability of food in the crater has led to inbreeding problems within the lion population.

A number of Masai and even a German settler couple lived in the crater at the beginning of the 20th century, and helped each other to protect their livestock against the crater’s resident predators. The crater also played host to a tragic moment in history: the famous German naturalist and filmmaker Michael Grzimek died here in a plane crash in 1959. He and his equally famous father Bernhard are buried side by side at the crater rim.

The crater has been a part of the Serengeti National Park since 1951, but is classed as a conservation area, allowing the Masai to lead their cattle to the crater floor for grazing. Only rangers and members of environmental protection agencies are allowed to reside permanently in the crater. Visitors are allowed to visit the crater for a maximum of six hours per day and can choose their timetable.
themselves. Tourists can stay at the heated lodges on the crater rim, a cool 7,200 to 7,900 feet above sea level.

The large distances between photographer and subject in the Ngorongoro Crater often cause technical problems. It is strictly forbidden to leave the few tracks and roads, and the crater is home to several rhinoceros refuges, which are also no-go areas for humans. Environmentally speaking, these measures are completely understandable, but they nevertheless make the wildlife photographer’s life a lot harder. Ungulates, lions, and rhinoceroses are often active near the road, but hunt scenes are often out of range of even the longest telephoto lens. Teleconverters are useful tools for circumstances such as these; they can extend the focal length of your longest lenses to a respectable 1000 mm or more. If you are using an APS-C camera, you can achieve similar magnifications using a 400 mm lens and a 1.7x teleconverter. If the lighting conditions don’t allow you to stop down by at least one full stop, your images will not be absolutely pin sharp but will still suffice for documentary purposes. The hunting cheetah shown here was photographed this way, and the printed crop is equivalent to a full-frame photo taken with a 1200 mm lens.

It can be quite unpleasant in the Ngorongoro Crater in June when the rain brings the temperatures down to as low as 50°F. The (very) poisonous puff adder shown at right was still on the prowl in spite of the cold. This snake is quite peaceable if you don’t get too near, but deadly if you happen to step on it. This is one of the reasons you should always wear sturdy shoes in Africa.
6.2 Photographing Hunting Lions

Lions often act quickly and without warning, so you need to be highly alert when photographing their hunting patterns. Lions hunt mostly at dusk or during the night, and their eyesight is far superior to that of their prey, making it easy for them to creep up in the dark. Lions need the advantage of surprise because their prey is often just as fast as (if not faster than) the lions themselves. Lions, like all big cats, are opportunists. If they have the chance to surprise potential prey, they will hunt during the day too. A lion dozing in the shade can be at full speed on the tail of a potential meal within seconds. In order to capture this type of action during the few hours of each day when you have access to the Ngorongoro Crater, you will need a driver with excellent local knowledge—one who has the necessary contacts to know in advance where hungry-looking prides of lions were spotted the previous evening. Make sure you are at the entrance to the crater at 6 a.m. sharp, and head to the specified area without delay if you want to find your subject in time. Lions, especially the more agile lionesses, often hunt alone, although I have witnessed two group hunts in the Ngorongoro Crater. This is possibly because lions must hunt in groups to kill the large buffalo found in the crater area.

When you find your target pride, use your binoculars or telephoto lens to determine whether their manes, necks, and mouths show signs of blood, and whether their bellies appear full. If this is the case, the lions have most likely hunted successfully during the night and won’t be on the move again too soon—unless, of course, they didn’t kill enough to feed the whole group. If you find a group without signs of a hunt, or which is on the lookout, or which is already targeting its prey (like the group in the photo on the right), you should initially keep sufficient distance to retain an overview of the situation. The next step is to search the area for the lions’ potential prey. In the daytime, this will most likely be a lone animal, often a gnu that is separated from the herd.
Pride of lions targeting its prey: Ngorongoro Crater, June 2005, Nikon D2x, AF-S VR 200-400mm f/4 lens, ISO 100, 1/200 sec. at f4.0
Your driver should only set off once a lion begins to creep up on its prey, allowing you to get an idea of where the chase is headed. Try to get into the best possible position on the available tracks. If you can't tell where your subject is headed, use a shorter focal length lens so that you don't end up cropping the frame unintentionally. In spite of the less than perfect perspective, you should always photograph chase scenes from the sunroof of your vehicle so that you can maximize your pan range. Set your motor drive to its highest speed and make sure you have enough free capacity on your memory card. Then select the shortest possible shutter speed that won't produce excess image noise and keep your subject in permanent view in the viewfinder.

The attack itself will happen quickly and only lasts a few seconds. A lion can accelerate extremely rapidly to speeds of nearly 40 mph, but can only run at maximum speed for about 250 yards. Always pan the camera in the direction the lion is running, as even the shortest shutter speeds cannot freeze this type of action head-on. You should also continually check focus. If you are lucky enough to already have a complete hunt scene in the bag, you can experiment.
with your panning technique to create even more dynamic, motion-blurred images. If, however, this is your first chase, you should probably choose a different moment to experiment, as you will only be disappointed if you end up photographing your first one-in-a-million scene out of focus. Make sure you agree with your driver on a plan of action, and make sure that the vehicle is not moving during the chase itself, as this will usually produce unwanted camera shake.

It is practically impossible to photograph moving animals from a moving vehicle with long telephoto lenses without the use of special vehicle and tripod shock absorbers. You even risk permanent damage to your equipment due to the hard knocks that leaf-spring jeep suspension can cause.

A typical case of just about everything going wrong. I hadn’t even set autofocus to Single-area AF when the driver started off (too soon), making it impossible to correct focus manually. The photo is therefore out of focus.
Successful wildlife photography also depends on sticking with the subject, even when the action gets brutal or bloody. Once you have the chase scene in the bag, photograph the rest of the action to complete the story. Complete documentary stories are easier to market than single photos. The story shown here illustrates a lioness teaching her one-year-old cub to hunt. The cub’s paws are already strong enough, but its mouth is still too small to kill the gnu effectively with a single bite. Lions usually kill using a suffocating bite to the neck and confirm the kill with a second bite to the mouth. Big cats generally only eat if they are sure their prey is dead. The kill usually takes a few minutes, but this gnu was only playing dead and kept restarting the fight every time the lions wanted to eat. The young lion’s attempts at the kill went on for over an hour until the gnu was finally killed by an older lioness.
Single-area AF autofocus with manual focus area selection is always the safest solution for photos like these. This is especially true when you are shooting under cloudy skies, as you will need to use wide apertures and shallow depth of field to produce the short shutter speeds and low ISO values necessary for noise-free images.
The hierarchy within the lion groups in the Ngorongoro Crater appears to be slightly unusual. Normally, the dominant male gets to eat first, often claiming ruminant innards (with their nourishing vegetable contents) for himself. Next in line are the lionesses in the pride, and the younger animals and cubs have to make do with the leftovers.

In our photo, the lionesses have driven their male counterparts away from the prey, and have themselves hardly eaten anything, leaving the gnu’s nourishing innards exposed and easy to reach for the younger lions. The lionesses and the younger animals will still fight for the best places “at table”; but this is normal behavior. The bloodied young lions look like something out of a horror movie by the time they have finished their meal. Scenes like these can cause more sensitive people to feel nauseous or to have nightmares, but they are nevertheless part of everyday reality in the wild.
6.3 Rhinoceroses—The Last of their Kind

Photographing rhinos (and especially black rhinos) in the wild is largely a matter of luck. What is it that makes these enormous beasts so fascinating? I think it is simply their behavior, which is completely different from that of almost all of the tired-looking specimens that we know from zoos around the world. Rhinos are extremely timid, very cautious, and rare. Only a handful of the thousands of black rhinos that once populated East Africa survived the massed hunting and poaching of late 20th century. The surviving animals were also seriously endangered until a young bull from the Serengeti joined the crater population, proving that the animals still follow long, thousand-year-old migratory routes in spite of the modern park borders. There are now about 60 black rhinos living in the wild in the Ngorongoro Crater and the rest of the Serengeti.

The rhinos were hunted and poached for their horns, which were (and unfortunately, still are) prized as dagger handles by Arab potentates and are ground to a powder that is supposed (predominantly in China) to enhance virility. The animals’ corpses were left to rot once the horns had been stolen and, even today, a single horn is worth 100 times the average East African annual wage. For this reason, the remaining animals are protected around the clock by park rangers.

Rhinos can be dangerous although, as Professor Grzimek proved, they often mount fake charges. Sometimes, even the people whose job it is to protect them have been fatally injured by rhinos charging at 25 mph. They have weak eyesight but can scent other animals over distances of many miles. A rhino mother with a calf in tow will stop every few yards and smell the air in all directions to make sure that her baby is not in danger from a predator.

In bright sunlight, and at any distance, you will need eagle eyes to be able to tell a dozing rhino from a weather-beaten termite mound. If you manage to make out a rhino, you “only” need to find a track that leads near enough to it to take a photo. Rhinos are mostly found in areas where off-road driving is prohibited. You can work around this problem in the early morning light or under cloudy skies by using an extreme telephoto lens, as in the image above. You might even be lucky enough to get sufficiently near to shoot using a shorter lens, as I was for the image on the right.
Chapter 7
The Ngorongoro Conservation Area
7.1 Siringet, the Endless Plain

In the 16th century, when the Masai migrated from northern Africa to their new home, they named the wide open country “Siringet”, which roughly translates as “endless plain” and which is now known as The Serengeti.

The Ngorongoro Conservation Area also belongs to the Serengeti, allowing the local Masai tribes to continue to live in harmony with the local wildlife as they have for centuries. The Ngorongoro Conservation Area in the eastern Serengeti covers an area of 3,300 square miles from the Gol Mountains in the north to the border with the South Serengeti, and is the region where the massed gnu births take place in January and February. But here, in this enormous area, even a million gnus searching for fresh grass can disappear from view as if by magic. This area of wide open savannah is, of course, “cheetah country”— home to the fastest of all the big cats.

During the 1950s, the Masai were chased out of their settlements in the Serengeti National Park area and resettled, even though their numbers had already been severely depleted by the famine caused by cattle fever at the turn of the century. Before the white settlers arrived, bringing previously unknown animal diseases with them, this proud pastoral people had lived for centuries in peace with the local wildlife. The Masai don’t eat game animals and so, with the exception of an occasional predator that is sacrificed in the course of a virility ritual, they do not hunt the animals surrounding them. This traditional cohabitation has become much more difficult, as the Masai hardly profit from tourism, and some animal welfare activists would like to see them completely removed from all game reserves. The main problem is the tribe’s cattle, dogs, and other domestic animals, which all have to be inoculated by animal welfare organizations to prevent the spread of disease among the wild animals in the region. The Serengeti’s lion population was reduced by almost a third by canine distemper in the 1990s, and is only now beginning to recover.
7.2 Gnus—The Real Superstars of the Serengeti

“We are the gnus. Many people think we look ugly and stupid, and the Masai even say that their god Lengai created us from the pieces left over once he had made all the other animals. But we are actually the secret superstars of the evolutionary process in the Serengeti. We were here long before the first humans, and we will still be here long after the last humans have disappeared. We simultaneously use and protect the land on our eternal wanderings through the savannah and we are also the main source of food for the predators of the Serengeti.”

“How boring” I thought, the first time I came to East Africa. There were gnus everywhere and not a single lion in sight. I admit that back then, apart from my dog Oskar, my love of animals had more to do with goulash, steak, and chicken wings than anything else. But then the penny dropped: without the gnus there would be no lions. It is clear to me now that the gnus determine the livelihood of the predator populations, and not the other way around. A half million gazelles are too fleet, and a similar number of zebras are too clever and too strong to simply end up as lion food. The numerous buffalo are so large that they can only be killed by lions hunting in groups.
Until relatively recently, it was thought that the annual gnu migration followed the water courses of the Serengeti ecosystem. If this were the case, however, the gnus would stay put on the banks of the Grumeti or Mara rivers, as they carry water year round. This would lead to a much smaller population, which contradicts the animals’ natural instinct for reproduction. In the wild, only the survival instinct is stronger than the reproductive instinct and the need to feed.

The gnus’ migratory instinct is driven by their need for fresh, nourishing grass. If an area has already been grazed they move on, following the water only indirectly by following the rain. In the Serengeti, fresh grass grows immediately where rain falls. Gazelles follow the gnus’ migration because their staple food consists of the short grass and easily digestible plants that are laid bare when the gnus eat the longer, coarser grasses. Zebras too eat some of the grasses left standing, and often migrate parallel to the gnus. Sometimes, zebras even take the initiative and lead the gnus on their way. All of these animals cover distances of up to 950 miles on their annual trek through the Serengeti.

You may wonder why I am going into such detail about these biological processes. Quite simply, if you don’t know about the workings of a habitat and the behavior of its animals, you will not find your way to the right place at the right time to take your photo. Whether you are shooting in the Arctic, the Antarctic, the jungle, or in a tropical rain forest, knowing how and where to find your chosen subject remains the first rule of successful wildlife photography.
The massed gnu births generally begin with the short rainy season at the end of January/beginning of February and go on for a few short weeks. They take place in an area covering about 4,000 square miles between the Gol Mountains in the Ngorongoro Conservation Area and the Gol Kopjes in the South Serengeti, so you will need a highly motivated driver/guide when you are on the road. The gnus follow the rains to the fresh, calcium-rich (and thus milk-producing) grasses. The time of the gnu births is naturally also a time of plenty for the indigenous predators. Lions, leopards, and cheetahs, as well as scavengers such as hyenas, jackals, and vultures all get to eat their fill. Mother Nature is at her most brutal

The birth of a gnu calf can usually only be photographed using a very long lens, and even that is not easy. Like elephants, female gnus retreat to a group of other females to give birth. If you approach such a group, the female will simply stop the birth process for as long as possible. If the calf has already been born, the mother may flee, leaving her calf behind. I believe that no human has the right to risk a baby gnu’s life for the sake of a photo. We should always leave it to nature to decide which animals survive.

Female gnu with newborn calf:
Ngorongoro Conservation Area,
January 2009, Nikon D3x, AF-S VR 600mm f/4 lens & 1.4x teleconverter, ISO 250, 1/8000 sec. at f7.1

Gnu calves get to their feet and follow their mothers within minutes of their birth. If a calf is too weak or too slow, it will quickly fall prey to natural selection.

Female gnu with newborn calf:
Ngorongoro Conservation Area,
January 2009, Nikon D3x, VR 600mm f/4 lens, ISO 250, 1/1250 sec. at f4.5
here, but even this slaughter is part of the process of natural selection. Some strong, healthy calves will of course be killed in the process, but it is mostly the weaker, slower young that cannot keep up with the herd and perish as a result.

Cheetahs are the most rapacious calf-killers. Once a sharp-eyed cheetah has spotted a very young or newborn gnu, its death is as good as sealed. The relatively small numbers of cheetahs, however, ensure that the gnu population is not endangered.
7.3 Cheetahs—The Fastest Predators

Cheetahs are the gourmets among the predatory cats and eat almost exclusively their prey’s muscle meat. About 90 percent of their daily fluid intake comes from their victims’ blood, and they require very little water to survive. The remains of the cheetahs’ victims are scavenged by jackals or vultures.

Antelopes protect their young from cheetahs by forming groups around them, and gazelle kids spend some time after their birth lying still in high grass or hollows in the earth until they are strong enough to run from their predators. When cheetahs can’t get close enough to protected gnu calves, as in the photo above, they turn to gazelles and their young to keep from going hungry.

Cheetahs are the fastest land animals in the world, and can accelerate extremely quickly up to (unconfirmed) speeds of 75 mph. They eat quickly because, in the open savannah, they simply cannot hide their prey from jackals or other scavengers. A cheetah can often chase off a lone hyena but is powerless against a whole pack.

Cheetahs and tigers are the most endangered hunting cats and, probably due to inbreeding, have very few natural defenses against disease and epidemics. Scientists are convinced that the entire cheetah population descended from a very few forebears, possibly even from a single mating pair that survived
some form of natural catastrophe thousands of years ago. All cheetahs are so closely related that they could theoretically receive transplant organs from one another without showing any signs of rejection. Due to their endangered status, conservationists are allowed to interfere with the processes of natural selection when, for instance, a young cheetah loses its mother and has to be hand-reared. In such situations, young cheetahs are fed live animals to keep their hunting instincts alive.

Panning is the magic word when you are photographing cheetahs. Whether you want to capture these “race-car cats” pin-sharp using ultra-short shutter speeds of $\frac{1}{8000}$ or $\frac{1}{4000}$ second, or with a little motion blur using shutter speeds between $\frac{1}{1000}$ and $\frac{1}{250}$ second, or even as a real action shot using shutter speeds as low as $\frac{1}{30}$ second, you can only keep a running cheetah in the frame by following its movement with the camera. This is difficult, even if you are using a 600 mm (or longer) lens, as your subject may well be chasing a gazelle that keeps making U-turns. The sunroof of your vehicle is the only reliable footing for the pan range necessary for this type of shot. Personally, I prefer to use a heavy monopod, as a tripod head mounted on the roof rails has a maximum useful pan range of about 160 degrees. A beanbag simply doesn’t allow smooth panning.
7.4 Hyenas—Merciless Hunters

In his excellent book *Serengeti—A Window on Creation* (Lübbe, 1999), the German natural history filmmaker Reinhard Radke calls hyenas “bonecrushers”. This is an apt description of these predators, who are biologically similar to cats but whose behavior reminds me much more of dogs. A hyena’s jaw can exert up to 2,000 pounds of pressure, by far the strongest in the animal world. Put down for years as mere scavengers, hyenas are nowadays counted among the most skillful hunters alive. They chase their prey to the ground in a similar way to wild dogs and wolves, but, unlike the big cats, they start eating their prey while it is still alive.

Hyenas can hear for up to five miles and can differentiate smells at distances of over a mile. Their trump card, however, is their stamina—they can keep up 40 mph running speeds for two miles at a stretch, and the longest recorded hyena hunt (chasing a large eland) covered a distance of 15 miles. Lone hyenas—and especially nursing mothers—often cover hundreds of miles searching for food.

Among themselves, hyenas display the most brutal behavior of all predators. A single female leads each pack of hyenas in a strict matriarchy. Female young take priority within the pack, and the strongest young female takes over the matriarch’s role when the time comes. The other females in the pack follow a strict hierarchy, and males of all ages and the young of other, weaker females take on the lowest rank of all. This pecking order often leads to fratricide within a pack, and higher-ranked females will kill the young of lower-ranked females if there is not enough food to go round.

Visually, hyena males and females are difficult to tell apart, as females have a pseudo-penis and pseudo-testicles. Dominant females usually only mate with the male young born to the higher-ranked females. Hyena milk is 15 times more protein-rich than human milk, helping hyena young to develop quickly. Hyenas are killed most often either in fights amongst themselves or with lions.

Hyenas can be found practically everywhere in East Africa. It is unwise to leave shoes outside your tent, as they can be easily recycled as food by a curious hyena’s strong digestive system.
As for all types of moving animals, you should pan your camera in the direction of movement when you are photographing running hyenas. This helps to eliminate unwanted motion blur.

Hyenas cause starkly varying reactions in humans. Some people hate them, while others love them. Our relationship to these animals can be best illustrated with an appropriate portrait shot. You can tell what I think of hyenas these days by looking at the two portraits above. The photo on the left was taken under poor lighting conditions in 2005, and the one on the right in the summer of 2007.
The hyena photos in this spread illustrate three common East African lighting situations. The shot above of the resting pack was taken around midday under a cloudy sky.

The vertical shadows are significantly softer than those produced by bright sunlight. All of the brighter parts of the animals’ fur show good detail, and no further corrections were necessary. This soft overall light makes it easy to correct exposure errors of up to +/-1 EV without losing any pixel detail.

In bright sunlight, always keep an eye on the image histogram, as it’s all too easy to lose highlight detail.
The long shadows make it obvious that the young hyenas shown above were photographed at the onset of the evening’s “golden light”. I set exposure compensation to -0.66 EV and selected low contrast and saturation to avoid burnt-out highlights. Color and contrast were corrected during post-processing. The photo below was taken in the cold light that dominates just after sunset. Contrast, color, and saturation were corrected later.

The prominent teats make this nursing hyena easily recognizable as female.
Chapter 8
The Serengeti National Park
One Man’s Dream

Serengeti who? Serengeti what? Many people would still be asking these questions today if it hadn’t been for one man and his actions at a time when phrases like “environmental protection” hadn’t entered the language and animal welfare was rarely discussed. Professor Bernhard Grzimek (pronounced “Chim-eck”) began his public career in the 1930s, when he published various magazine articles on the subject of domestic pets. But that wasn’t enough for him.

He performed as a Bengal tiger tamer (without any training!) and wrote books about various animals that brought him his first real public acclaim. An early bout of astuteness (a Grzimek trait which later became chronic) helped him get through the troubled war years. He used his burgeoning popularity to coin the phrase “Your Horse—An Unknown Species” and to convince German leaders that horse behavior desperately needed research. His work with cavalry horses was supposed to ensure wartime security should German tanks fail at the European front, and was obviously worth more to his patrons than his potential death in the field.

He moved to Frankfurt during the last days of the war and quickly recognized that educated, English-speaking men were in great demand by the American military government. He rose quickly within the government and soon took over a bombed-out compound populated by a few animals, formerly known as the Frankfurt Zoo. He rebuilt the business as a combined zoo and amusement park and used the income it generated to return the Frankfurt Zoo to its former international glory. His mischievous publicity stunts at the time included painting an elephant white to attract visitors with a “new animal species”. He was made director-for-life of one of the most famous zoos in the world, but he still continued his search for inspiration.

Under the pretense of acquiring new animals for the zoo’s collection, he went to Africa with his eldest son and best friend, Michael. The pair travelled through West and Central Africa loaded down with all sorts of film and still cameras in an attempt to establish themselves as natural history filmmakers. Heavily in debt, the father-and-son team produced their first film, “No Place for Wild Animals”. Thanks to the acclaim brought by international film prizes, they managed to refill their adventurers’ purse. Grzimek had by this time scented something bigger and more visionary with which he could leave a lasting impression on the world—and at last, he found what he was looking for.

He had landed in British East Africa—an area which also included the former German East Africa. This supposedly godforsaken place, with its meagre summer, countless wild animals, and few remaining Masai tribes, was what we now know as the Serengeti.

This magical period in his life, which also became the most tragic, saw the development of his idea that the animals of the Serengeti must be counted and understood, and the need for their protection must be made tangible to the rest of the world. He was sure that he could realize this dream if only he could
make it attractive enough. The success of their first film inspired the father and son team to make a full-length documentary, and to use it to popularize their ideas.

Grzimek recognized from his maps that the land in question, covering an area one fifth as large as Germany, could only be documented from the air. Back then, precise geological satellites didn’t exist, and Sputnik I was still producing its first orbital beeps. Inspired by the Fieseler Fi 156 “Stork” aircraft with its short take-off and slow-flying capabilities—ideal for film and animal-counting use—the Dornier aircraft company built the famous zebra-striped D-ENTE reconnaissance plane for the Grzimeks. Both quickly acquired their pilot’s licenses and packed the plane to the brim with fuel, food, camera gear, and huge amounts of film before setting off on their pioneering adventure.

Just before Christmas 1957, we find two idealists—with as much flight experience as a baby bird that has just fallen from its nest—sitting in a slow, single-engine plane headed for East Africa, 5,000 miles away. In spite of some nerves over the Mediterranean they arrived safely, but only when they began to survey the enormous East African plains did they actually realize the scale of the project they had taken on. They succeeded by dividing the entire area into quadrants which they surveyed from the air, day by day. They employed assistants who used pen and paper to note the animal counts made during endless low-altitude flights over the savannah. And they spent the whole time simultaneously shooting material for their new film. They were the first to document not only the size of the enormous herds of ungulates that populate the Serengeti, but also the annual migratory patterns that the herds follow. The Grzimeks’ methods are still used today, in modernized form, by conservationists the world over.

At the beginning of January 1959, Michael Grzimek started off on a flight into the Ngorongoro Crater and never came back. He collided with a vulture in mid-flight, lost control of his plane, and was killed instantly in the resulting crash. He was buried the next day, January 10, 1959, at the crater rim. Bernhard Grzimek never recovered from the loss and attempted to drown his sorrow with work, work, and more work. He finished editing their film “Serengeti Must Not Die” in record time, and was rewarded with the first ever Oscar for the still crippled post-war Germany. He soon became the best-known natural history filmmaker and conservationist in the world. The book that accompanied his film became a worldwide bestseller; translated into many languages, it is still a standard Serengeti reference book for many naturalists. As television grew in popularity, Grzimek began work on a TV show, “The Animal Zone.” He produced 175 episodes of the show, working right up to his death. His was the only show I was allowed to watch as a child in the 1960s (back then, still in black and white).

Later in life, he devoted his entire energy to animal protection and promoted animal welfare as one of the most important goals left to the post-industrial human race. In his capacity as director of the Frankfurt Zoo, he set up environmental and animal welfare research stations in the Serengeti and all over the world. He became the biggest collector of donations to animal causes the world
had ever seen, and he even sealed friendships with many of the presidents and potentates of the newly independent African countries. He managed to convince a number of dictators (who would later go down in history as murderers) of the need to protect the environment and the animal world, if only because the indigenous animals were a great potential source of income for their countries’ leaders. We have Grzimek to thank for the fact that some of the poorest African countries still maintain enormous wildlife reserves, and the films and images produced by Grzimek and his successors ensure that tourism in Africa is continually on the increase.

During all this time, Grzimek risked his own life time and again for the sake of his research; for example, bobbing about among hippos and crocodiles in a tiny amphibious vehicle in the Congo, or spending time amongst rhinos in a rubber rhino suit in the Ngorongoro Crater. He needed his animal fix and showed himself (and often others) little respect in the process!

When he died in 1987 he left a fortune which gave many critics cause to accuse him of self-interest. But, at the end of the day, his personal fortune was tiny compared to the enormous sums he had collected for environmental and animal protection causes. He made sure before his death that he would be buried next to his son Michael at the rim of the Ngorongoro Crater.
8.2 Savannah, Kopjes, Bushland, and Forest

The Serengeti is not only comprised of huge areas of savannah, but also areas of bushland interspersed with small areas of low forest that stretch northward to the Mara River. Forest growth is more extensive along the rivers, with the higher ground water level helping the trees to spread beyond the riverbanks. Scattered areas of differing sizes soak up the ground water like a sponge and remain moist well into the dry season. As you can see in the elephant photo below, the grass in these swamplike areas can grow head high.

The South Serengeti is also liberally sprinkled with so-called “kopjes”. These isolated rock hillocks appear to have sunk into the ground, which is almost true, as they have actually been buried by the volcanic ash produced in the Ngorongoro area over millions of years. Lions often doze on kopjes, and you should always take a careful look around before leaving your vehicle—even on the Masai kopjes, which are well-established picnic spots.

In the dry season, it is advisable to drive ahead of the pack rather than behind. Otherwise you will have to take regular breaks to allow the dust to settle and the track to reappear. If you are in for a long drive, always shield your camera from dust—a simple plastic bag or your rain jacket will do. The dust in the Serengeti is so fine that it will nearly always find a way into the moving parts of your camera, especially the zoom and focus rings of your lenses.

In the Serengeti’s Western Corridor, the gallery forest along the Grumeti River shares the land with bush and partially wooded savannah. During the Great Migration in June and July, the Western Corridor is a great place to work; the tourist industry is not yet established there, and the area is not overrun with day-trippers.
A kopje is nearly always worth a closer look. You can often only drive around the base, but sometimes you can actually drive onto them. If you are on foot, make sure your footsteps can be clearly heard, as you will often find big cats dozing in the shade of the rocks.
8.3 Hunters of the Savannah

Cheetahs can often be seen in the Serengeti’s savannah areas, where they are able to make full use of their great speed while hunting. These agile creatures are ideal subjects for various types of photos, and are especially suited to movement studies using multiple exposures.
Multiple exposures can usually be selected and set directly in the camera, and most cameras will automatically distribute the metered exposure value between the individual shots, avoiding overexposure in the final photo. The problem with this type of programmed multiple exposure is that the background is exposed in every shot, making it all but unrecognizable in the lower layers of the final image. I used the Photoshop Eraser tool to remove the background around the cheetah in the upper layers of this image sequence.
Please note that this image is not a “real” multiple exposure. It was put together using Photoshop and several individual shots taken from a motor drive sequence.

Cheetah cubs are often chased, killed, or even eaten by larger predators, and even by other big cats. In some areas of East Africa, only 15-20 percent of all cheetahs survive their first year. The behavior of a nursing cheetah mother is fascinating to observe and to photograph. She communicates with her young using high-pitched yipping sounds, chasing them off in all directions at the slightest sign of danger so that they cannot all be killed at once. Once the danger is over, the young cheetahs peek out from the high grass at the first yip from their mother, and rejoin her once she has chirped the all-clear.

Cheetahs of all ages are no longer shy of tourists, and they even use the roofs of jeeps as lookout posts while they are hunting. Once they have secured their prey, they often drag it off under a jeep to keep it from being seen by vultures, and to avoid attracting jackals and hyenas. If your jeep is being used this way, you are in for a long wait, especially when young cheetahs are involved. However tame the animals might seem, you should nevertheless approach them carefully and considerately, especially in areas that are not often visited by tourists. If a cheetah mother makes even a slight sign of wanting to chase off or carry off her young, you should stop immediately and wait until she calms down. Don’t leave your vehicle while you are in her view, as she will immediately try to bring her young to safety, which can endanger the lives of the youngest cubs. If you are patient, most mother cheetahs will allow you to get near enough to take a portrait. As you can see on the right, some mothers are even proud to present you their families.
This photo of a family of cheetahs makes a great picture, but it leaves a lot to be desired technically. The subject distance, and therefore the selected focal length, is too short, making the background distracting. Having said that, this shot requires a depth of field of at least three feet to keep all the cheetahs’ faces in focus, so the background will be distinct no matter what focal length or subject distance is selected. The background of this image would have to be considerably softened during post-processing to be used professionally. The half-shadow lighting is also not ideal. If you look carefully, you can see that color and saturation in the shadow areas have been strongly “assisted”. But I like this photo anyway—ideal shooting conditions are rare in the world of wildlife photography.
8.4 Migration and the Mating Season

The Great Migration of the gnus from the Serengeti to the Masai Mara is a gigantic natural spectacle and a first-class photo opportunity. Where large herds gather, predators are never far behind, whether they are lions in the savannah or crocodiles in the rivers that the herds must cross. Furthermore, you will always find gazelles in areas where gnus have grazed the grass flat, and where gazelles gather, you are sure to find cheetahs.

Even if you are not particularly interested in photographing ungulates, you need to know about their migratory habits if you want to photograph their predators. And the game is the same in other regions of the world. If, for example, you want to photograph the wolves that follow and hunt the enormous herds of migrating caribou in Canada, you might spend days observing caribou before you get to see a single wolf.

But the Serengeti is rarely boring. The beginning of the dry season in May is when the Great Migration slowly starts to take shape. The newborn calves are big enough and strong enough to follow the herd, but are still completely dependent on their mothers for survival. Young calves are favorite prey for all big cats and hyenas. This period is also the start of the rutting season. The bull gnus jump around erratically in an attempt to impress the females of the herd into joining their harem. Rival bulls will literally break each other’s skulls in the fight for the right to mate.

Meanwhile, the herd continues its migration towards the region surrounding the Moru Kopjes, where there is still sufficient fresh grass and water to feed the herd. The herd will continue to gather until they are standing shoulder to shoulder for a period of some days known as the “Moru Crush”. Once this area has been grazed, the actual migration begins. About two-thirds of the group set off in single file on a trek that last several weeks and takes them northwards through the Central Serengeti and on to the Masai Mara in Kenya. The other third of the herd turns towards the “Western Corridor”, as if led by an invisible hand, before it too turns northward on the long march to the Masai Mara. The fact that the entire spectacle takes place at the coolest time of year is not necessarily a disadvantage for us wildlife photographers.

Many people imagine it is much simpler to photograph large herds of animals than is in fact the case. I am still not really happy with any of my herd shots. In
fact, I have never seen a single photo that properly illustrates the drama involved in the Great Migration. “What drama?” you might ask. And that is exactly the problem.

The photo below shows a part of a herd of around 40,000 animals in the South Serengeti that was about four miles long. The human eye can easily follow this type of scene and register amazement to the brain. A movie camera can do just about the same, and the lack of depth of field doesn’t really show. But, as a photographer, you can only usually get within 20 or 30 yards of your subject. How about using a wide-angle lens? Forget it. If you can’t get within a few feet of the herd, your photo will show a huge green expanse with a few brown blots in the background. Even a 600 mm telephoto lens doesn’t compress the scene to the same degree your eye does, and it will only depict a small section of the scene. Even if the light is bright enough to allow you to stop your lens right down, it will still have much too little depth of field; in addition, the mirages and dust in the air will reduce resolution in the distance.
One possible way to photograph the mass of gnus successfully might be to use a short or medium telephoto lens and shoot from a low-flying aircraft. A close group like the one at the water hole below is much easier to photograph effectively than the sheer mass of the entire herd.
If you want to photograph predators, you have to follow the gnu herds. In the regions the gnus pass through during their migration, you will continually come across predators in action. Gnus are extremely gregarious animals, and if a lead animal takes off, the others are sure to follow. They use about the same amount of energy while trekking as they do while grazing or ruminating, and can consequently cover enormous distances on their annual migration.

Gnus themselves are also interesting photographic subjects, especially when they start running. This is a perfect situation for applying a number of different photographic techniques. It is also a great opportunity for learning new techniques, as the action usually lasts for several minutes at a time. The image on the right uses a motion blur effect, while the one below freezes the action pin-sharp in mid-leap. The image at below right uses a chase perspective at a place where the gnus cross a track.

8.5 The Long Trek North

It is estimated that up to 50,000 gnus are lost to poachers and up to 200,000 more to accidents and predators during the long trek from the South Serengeti to the Masai Mara in the north. The losses in the broad, open savannah are much lower; they only begin to mount once the gnus reach the forest and bushland in the central and northern Serengeti, where their predators have much better
cover for hunting. In spite of heavy fines, poaching is still a significant problem closer to the more heavily populated areas surrounding Lake Victoria in the northwestern Serengeti. Despite all these dangers and pitfalls, the gnu population in the Serengeti ecosystem has remained stable at about two million for a number of years.
Zebras—The Scouts of the Great Migration

Zebras, often called “tiger horses” by Professor Grzimek in his books, are to me the cleverest animals in the Serengeti. They are timid and cautious, and, unlike antelopes and gazelles, appear to be aware of the danger of crocodiles at riverbanks. They nevertheless suffer heavy losses to predators during their annual migration. In spite of their timidity and heightened awareness, they are often the first victims of the huge crocodiles at the Grumeti River crossing. But even more zebras are killed by surprise lion attacks. A lion has little chance of success in an open, full-frontal attack on a zebra, and zebras often launch counterattacks, running at the lion at great speed, only to dodge a collision at the last moment. Zebras can also deliver bone-cracking kicks in a fight with a lion. These baying horses are almost impossible to domesticate and are quite capable of biting through a human arm. You will often see small groups of zebras at the head of the gnu lines, leading the herd on its way. At other times, zebras will try to drive gnus away from water holes and riverbanks, and display behavior that is irrational and contrary to their other observed habits. For example, in 2008, the first zebra herds arrived two months earlier than usual in the Masai Mara (and therefore two months before the gnus).
If you observe a herd of zebras drinking peacefully at a riverbank or a water hole, select a short shutter speed and watch the animals through your viewfinder. Zebras are very jumpy when drinking and even if there are no crocodiles in sight, they can take off like a swarm of birds in the blink of an eye. They then hang back near the riverbank and only slowly return to the water to continue drinking. This erratic cycle sometimes repeats several times for periods of up to an hour. If you

Zebras taking off in panic at a water hole:
Serengeti National Park, June 2005,
Nikon D2x, AF-S VR 200-400mm f/4 lens, ISO 100, 1/400 sec. at f6.7

Double zebra portrait:
Serengeti National Park, June 2005,
Nikon D2x, AF-S VR 200-400mm f/4 lens, ISO 160, 1/400 sec. at f4.0
are lucky enough to be shooting with strong backlight or sidelight (unlike in this photo), the foaming water can look fantastic in the final image.

Zebras often cause problems with autofocus systems. Newer cameras are less susceptible to this type of problem, but older, contrast-based autofocus systems tend to wander off the subject due to the excess contrast caused by zebra skin within the autofocus metering areas. When photographing zebras, always double-check your focus and focus manually if necessary.
8.7 The Western Corridor

The Western Corridor is the Serengeti’s true “Wild West”. The landscape here, nearer to Lake Victoria, is more varied and somehow more primordial, especially around the Grumeti River. This area, with its wooded riverbanks and large numbers of crocodiles, is much more like the “real” Africa I had imagined than the areas around the middle and upper Mara River in Kenya. The region is bursting with wildlife during the Great Migration, and many visiting predators from other, dryer parts of the Serengeti come here to ensure their own survival. The area is also of great interest for wildlife photographers in general, as it is not as full of tourists as some parts of the Central Serengeti.

Favorite subjects are the huge crocodiles that live in the Kirawira region, some which are said to be old enough to have met Dr. Livingstone! These frugal, dinosaur-like creatures only get to eat their fill once a year, when the massed gnus and zebras cross the Grumeti River during the Great Migration—one of the major highlights in a wildlife photographer’s Western Corridor calendar. This area is also close to the densely populated east shore of Lake Victoria and is consequently subject to heavy poaching by humans.

Even nature cannot heal some wounds. This older male giraffe (his darker fur betrays his age) stumbled into a primitive poacher’s snare. The snare bit deep into the giraffe’s flesh as he tried to escape and cut off the circulation in his lower leg, which is turning black. The rusting snare will continually re-infect the wound, and the resulting smell will soon attract predators. I am fairly sure that I was nearly the last creature to see this beautiful animal alive.
Crocodiles—The Last Remaining Dinosaurs

Today’s crocodiles have lived on Earth for over 100 million years, and they are the last creatures to have survived since the time of the dinosaurs. They survived because they are extremely frugal and adaptable. Crocodiles can slow down their metabolism so that one heartbeat every two minutes provides them with sufficient oxygen, and they need to eat only 10 percent of their own body weight each year to survive. They can even survive for up to two years without eating anything. Adult crocodiles are about 10 feet long and grow only an inch or two per year once they reach their full length. If you get to meet a 16 or 17-foot monster, you can be pretty sure that it has survived the entire twentieth century. Scientists estimate that the Nile Crocodiles living in East Africa can reach ages of up to 140 years.

In spite of their natural frugality, crocodiles can be quite sneaky and even gluttonous. They approach silently under the water’s surface and then wait for an opportunity to snatch their victim—although in the case of a crocodile, “snatching” is more like a whirlwind breaking loose. A crocodile uses its
extremely strong tail to launch itself and its prey several yards up the riverbank, where it can chomp down with its huge mouth. A crocodile’s victim is usually an animal that has come to a river to drink, or one crossing a river at migration time. But crocodiles also attack humans fetching water or washing clothes. A crocodile drags its prey into the water and finishes it off by drowning it with the infamous “death roll”. Crocodiles cannot chew like humans and simply rip chunks of meat from their prey and swallow them whole. The food is then “processed” by the crocodile’s extremely strong stomach acids and the gravel it swallows to help its digestion.

You need patience and a whole lot of luck if you want to photograph a crocodile attack at a water hole. Many filmmakers have used miles of film without capturing any usable footage. If you find yourself in an appropriate situation and you have even the slightest doubt that your autofocus system can react quickly enough, always focus manually on the point where you think the crocodile will attack. Once the water starts to boil, you will no longer be able to focus effectively.

In order to use as little energy as possible, crocodiles keep their body temperature constant by alternating between sunbathing and cooling off in the water.
It is still possible to work at your own speed in the Western Corridor. It is rare that a jeep full of tourists will zoom through your frame, chasing off your subject or its prey, as so often happens in the Central Serengeti or the Masai Mara. The Western Corridor is still wilderness—the “real” Africa.

When I travel to the Serengeti, it is usually to photograph the herds of migrating ungulates. If I want to photograph lions, I go to the Masai Mara, where I am almost on first-name terms with many of the animals, and where I can find my subjects much more easily. However, once I have presorted my images from a gnu trip and am left with a two-week stock of around 2,500 migration photos on my hard disk, I nearly always find 5,000 or 6,000 lion photos that have somehow
found their way into my collection. These animals simply fascinate me, especially the wiry lionesses with their perfect hunter’s physique.

The young lioness in these photos—almost pure muscle and without any battle scars on her face—was a particularly beautiful specimen. She didn’t really seem hungry, and was simply lying around dozing and yawning in the long grass when I spotted her. But lions are opportunists when it comes to bagging an easy meal. My lioness continued to observe the nearby zebras and gnus disinterestedly until a female gnu with a young calf got to within 50 yards of her. Then everything happened as quick as a flash—she ducked down in the grass, stretched her neck and forelegs, and set off at speed. Such opportunities are rare, and I luckily had two cameras ready to shoot with medium and long telephoto lenses.
I initially thought that the gnu calf was the intended victim, and I was glad that my “better half” had stayed back at camp, as the death of a young gnu can be a fairly traumatic spectacle. But the lioness attacked the mother gnu, and in spite of the fact that another gnu crossed her path at an even closer distance, she stuck to her target. Once she was on the hunt, she didn’t allow herself to be distracted by easier prey. I found a possible explanation for this behavior later in a Grzimek book. Before technological progress made it possible to fix electronic transmitters to migrating animals, Grzimek often used paint to mark animals and to make observing their migratory patterns easier from the air. Unfortunately, these marked animals appeared sick (or at least somehow different) to their predators and were always the first to get eaten. The gnu chosen for the kill by my lioness had a large, visible blotch of bird mess on its back—maybe this stupid accident was the reason it had to die. The calf would most likely not have survived for more than three days following the death of its mother, as it was still dependent on her milk. Other nursing gnu mothers usually chase off calves that don’t belong to them.

Lions take enormous strides when they are hunting. They take off from their forelegs and bunch their bodies so much that their hind legs almost reach their ears. Once they hit the ground again, they stretch their bodies out as far as possible in preparation for the next leap. The individual elements that make up this movement (which can reach speeds of up to 40 mph) are hardly distinguishable to the human eye. If you don’t want to take a panned or motion-blurred shot, select the shortest possible shutter speed that your camera’s noise characteristics allow. Then select Dynamic-area AF autofocus to cover the center third of the frame. Grass or bushes in the foreground can cause autofocus to lose track of the subject, so always check focus manually and pan the camera if you want to shoot sharp photos of a moving lion. Once you gain enough experience, you
can shoot using Single-area AF, but you will nevertheless need to use the cursor or the multi-selector to keep your subject covered by the selected focus area.

Your camera should be capable of buffering at least 25 shots at maximum motor drive speed. If not, you will have to wait a few seconds after every four or five shots while your camera saves the image data.

A professional-level APS-C camera with a zoom-telephoto lens (such as the Nikkor 200-400mm) is better than a full-frame camera with a fixed focal length lens for shooting chases. You can use a zoom lens to alter the emphasis within the frame during a hunt. The potential gain in sharpness that a full-frame camera offers will usually be offset by the motion blur that is (nearly) always present when you are photographing running animals.
Big cats nearly always attack their prey from the side in order to avoid any kicks their victims might deliver in self-defense. Full-frontal attacks are always aimed at the victim’s neck in order to avoid contact with its horns. Injured lions can often only survive with the help of their pride, and heavily injured big cats generally fall prey to hyenas.

The moment of the kill is the crux of every hunt scene. A chase scene without photos of the kill is impossible to sell as a reportage. In order to shoot the best possible (complete) story of a scene like this one, keep shooting for as long as the light and the park rules allow.
I read that Dr. Livingstone was once attacked by a lioness during his travels through East Africa, and was only rescued at the very last second. He described how the shock of the situation meant that he felt no pain as the lioness bit down. The traumatized, almost calm-looking gnu in these pictures lends credence to this testimony. If a lioness should ever mistake me for a gnu or a zebra, I hope that this story is true.
8.10 Elephants—Eating the Bush Bare

Elephants need to eat more than 500 pounds of grass, tree bark, and twigs daily, and to drink more than 25 gallons of water every day to survive. These habits cause constant change within the elephants' habitat—in this case, the Serengeti ecosystem. Savannah is created where elephants eat the bush bare, and grassland turns into bush when elephants stay away. The elephants’ status as a protected species means that they have bred strongly in recent years, and are nowadays a source of conflict in many regions. Elephants can, for instance, eat an entire banana plantation bare overnight. Elephants live matriarchally, and spend almost their entire lives on the move searching for food, sometimes in enormous herds. I once saw more than 400 elephants in a single group in Tsavo, Kenya, although there wasn’t a single elephant to be seen for miles when I woke up the next morning.

Elephants have no real natural enemies apart from humans, although some larger prides of lions have begun to hunt elephants at night in some of the drier regions of southern Africa. Elephants have an extremely sensitive sense of smell, but their eyesight is only about as good as that of a human. Lions use this to their advantage and panic elephant herds at night until a single (often young) elephant that can be easily killed gets separated from the group.

Stories about elephants’ graveyards that many of you know from books and older films is based on a natural phenomenon. Elephants have molar teeth that regenerate six times during their 50 or 60-year lifespan. Once the last set is worn down, an elephant can only eat soft grass. This means that, at the end of their lives, elephants die slowly but surely due to a lack of vitamins, or they simply starve. Soft grass is found mostly in marshlands, which in turn means that older elephants end up in marshy areas during the search for their “last meal”. These areas are the source of the graveyard myth.

An elephant devouring a bush: Serengeti National Park, June 2005, Nikon D2x, AF-S VR 200-400mm f/4 lens, ISO 200, 1/200 sec. at f4.0

Elephants can be very dangerous, especially in areas where they are not used to seeing tourists. Always make sure you have an escape route planned, especially if the group you are observing includes babies and young animals. I can assure you, if you don’t take an initial, fake attack seriously, it’s no fun to be chased by a three-ton elephant running at 25 mph in an area where you can’t drive away faster than he can run. A jeep is about as useful as a cardboard box if an elephant decides to attack with its tusks.
Elephants—Eating the Bush Bare

Seasonal
Great Migration
May-July
8.11 The Courtship Dance

Male elephants rut once a year, and their condition during this period is called “musth”. The amount of testosterone in a musth elephant’s blood is 60 times higher than normal, making him extremely aggressive and dangerous. Once a musth elephant has found a female in heat, the pair engages in mating rituals that can last for hours, and which are often interrupted by rival bulls. Once any rivals have been chased off, the elephants’ almost human-looking canoodling resumes. The lovers rub their heads and bodies together until the female is ready to mate. The female in the pictures here strung her lover along for so long that he had problems fulfilling his duties!

At 22 months, elephants have the longest gestation period of all mammals. I am certain that I once saw twin baby elephants in the South Serengeti. We were in a wooded area when we came across a mother elephant with two tiny babies that can’t have been more than a day or two old. If one of her sisters hadn’t coincidentally given birth and then almost immediately died, the babies must have been twins. Unfortunately, the air was extremely dusty, and I was only able to photograph the group from a distance of about 100 yards due to a young bull elephant that kept approaching us. We even tried to approach in reverse gear to make it easier to escape, but the bull elephant cut off our retreat—a critical situation which fortunately ended safely.

If you specifically want to photograph elephants, the Serengeti is good but not ideal. Other areas—Amboseli in Kenya, for example—have much larger elephant populations. The elephants there are also much more used to tourists, and are consequently much tamer. Although it is forbidden to go off-road there, you can usually get near enough to the animals to shoot using a 200 mm or 300 mm lens. Amboseli has been home to so many elephants for so long that the bush is almost completely gone, and the last few trees and bushes have been
fenced to protect them. The Tarangire National Park in Tanzania and the Chobe National Park in Botswana are also very good destinations for elephant photography. The original population of about 5,000 in the Chobe National Park has grown to about 100,000 in recent years, making it difficult for all the elephants to find sufficient food. This results in elephants looking for food in human plantations, guaranteeing continued conflicts of interest.

The African continent maintains much larger wildlife reserves than any part of the richer, western world, although these areas are hardly large enough to support the constantly increasing elephant population. If the human population also continues to increase as it has over the last 50 years, it will become necessary to start culling elephants so that food within the wildlife reserves can adequately feed the remaining animals.
Hyenas and a lion fight over a gnu cadaver:
Serengeti National Park, July 2005,
Nikon D2x, AF-S VR 200-400mm f/4 lens, ISO 200, 1/250 sec. at f4.0

Hyenas planning to steal a lion’s spoils:
Serengeti National Park, July 2005,
Nikon D2x, AF-S VR 200-400mm f/4 lens, ISO 100, 1/250 sec. at f5.0
8.12 Food Envy

Who is a hunter and who is a thief? You can only really answer this question if you have witnessed the original hunt, as lions and hyenas often steal each other’s food. A large pack of hyenas can easily take the prey from a smaller group of lions, although when a group of lions attack a pack of hyenas, the outcome is almost always in the lions’ favor.

As with all pairs of predators, lions and hyenas are deadly enemies. In the photos on these pages, the rest of the pride of lions is resting a way off, and two young lions are left defending the group’s freshly killed gnu cadaver. Because the lions have already fed, their defense is rather halfhearted. The cheeky hyenas keep stealing small pieces of meat until the lions become fed up and leave the entire cadaver behind.

Lions can run just as fast as hyenas, but hyenas have much greater stamina. When hyenas fight over food, they squeal and “laugh” at volumes that can be heard for miles. During this scene, the hyenas were so psyched that they kept surrounding our vehicle, and I was sure they were about to substitute me for their gnu cadaver. Just this once, I was happy when the “after breakfast” tourists arrived to share the spectacle.
The major technical problem in these photos is the lack of depth of field. This problem couldn’t be adequately solved by using acceptably grainy film or relatively noise-free ISO values, especially in the shadows beneath the tree. Modern, high-speed, full-format cameras with extremely sensitive image sensors can deliver great results at ISO values of up to 3200, and can thus help to increase depth of field by up to four stops. This kind of depth of field would have brought the hyenas and the lion under the tree into focus.

There was no way around the lack of depth of field in the chase scene below—the animals were only about 20 to 50 yards away and were moving towards the camera at speeds of up to 40 mph. One possible workaround for situations like this would be to vary the focus setting from near to distant during a bracketing sequence—although such a sequence with a moving animal as its subject might look faked, and is probably better left untried in a wildlife context.
Hyena fleeing with stolen meat:
Serengeti National Park, June 2005,
Nikon D2x, AF-S VR 200-400mm f/4
lens, ISO 100, 1/400 sec. at f5.3

Hyenas with a
stolen gnu cadaver:
Serengeti National Park, June 2005,
Nikon D2x, AF-S VR 200-400mm f/4
lens, ISO 100, 1/250 sec. at f5.3
8.13 Gazelles and Impalas

Basic rules of life repeat themselves everywhere in nature, and, of course, in the Serengeti too:

In order to survive, antelopes and gazelles have to run faster than their fastest predator every day of their lives. Conversely, every lion, leopard, cheetah, or hyena that doesn’t want to starve has to run faster than the slowest antelope or gazelle every day of its life.

Sick or lame animals, or animals that behave crazily because they’re infested by parasites, are often the first to fall victim to predators. Predators look for prey less able to defend itself, and thus avoid injuries that can turn the predator itself into an easy victim. The simple principle of natural selection dictates that only the strongest members of a group contribute to the perpetuation of the species. This knowledge makes life for us wildlife photographers easier, even if it contradicts our conservationist instincts to observe and photograph the carnage. Most creatures in the wild do not die of old age, and even the strongest lion gets eaten at some point. Mother Nature at peace is only a figment of the human imagination—if you approach a peacefully grazing group of 2,000 antelopes from front left, it is highly likely that some predator is busy killing its lunch three miles away at back right of the same herd.

Impalas, Grant’s gazelles, and Thomson’s gazelles can reach very high speeds when fleeing from danger, making the techniques to photograph them similar to those used for cheetahs. Cheetahs are the only predators that can actually...

This image displays the typical, artificially compressed distance (here between the lion and the gazelles) that is caused by long telephoto lenses. The scene appears more dangerous for the gazelles than is actually the case. When I asked my driver to head to the right, so as to avoid photographing the lion from behind during the chase, he just laughed. Gazelles can run up to 25 percent faster than lions and make constant U-turns. Lions are simply too big and slow to catch a gazelle with a full-frontal attack. They can only catch gazelles if they have the advantage of surprise, and if the gazelle can be tricked into running directly into the lion’s path.
run faster than gazelles and antelopes, and consequently these type of animals are their preferred prey. Leopards also hunt antelopes and gazelles; although they are not as fleet as cheetahs, they creep up to within a few yards of their victim before pouncing at lightning speed. Leopards are a timid impala’s greatest enemy, as they inhabit the same forest and bushland habitats.

Thomson’s and Grant’s gazelles are also hunted by pythons. It is hard to believe that these snakes can actually swallow a gazelle in one piece. The photo below—taken from an unsatisfactory viewpoint after sunset—has no photographic value but is, due to its rarity, an interesting documentary shot.

This male impala is fleeing at too acute an angle to make a successful pan possible. If you want to use panning techniques in situations like this, you can often achieve artistically blurred results. Here, it was more important to me to capture the impala’s leap in sharp focus.

Male impala on the run:
Serengeti National Park, June 2005,
Nikon D2x, AF-S VR 200-400mm f/4 lens, ISO 200, 1/500 sec. at f5.6

Python swallowing a gazelle whole:
Serengeti National Park,
February 2009,
Nikon D3x, AF-S VR 200-400mm f/4 lens, ISO 800, 1/100 sec. at f4.5
8.14 The Big Antelopes

Topi are an East African subspecies of the cow antelope *damaliscus lunatus*, and can be found virtually everywhere in the savannah. Topis often stand motionless for hours at a time on termite mounds, rather like security guards. They are generally sedentary and only migrate within their traditional grazing grounds. Even if it is not apparent at a first glance, these animals are cleverer than gnus, and they are as cautious as zebras when they are drinking at water holes or when they find themselves in hollows in the landscape.

Elands are very large ungulates. They have an odd-looking, hopping stride which can nevertheless take them up to speeds of nearly 40 mph and enables them to leap more than six feet in the air. In spite of their size and speed, these cow-sized beasts are often hunted by comparatively small hyenas.
Patience is often richly rewarded when you are observing less spectacular species. This portrait of a female topi and its newborn calf taken in the evening light is one of my all-time favorite photos, even if the high ISO value required by the low light levels makes it slightly noisy.
9.1 The Mara River—Life Source and Barricade

It is early, just after 5 a.m. A large warthog is sitting in front of my tent in Governors’ Camp, and the waiter who brings me my early morning coffee ignores it completely as he passes me my tray. OK, I thought, we’re in Africa, and I went out to enjoy my coffee in the dawn with the warthog. The Japanese inhabitants of the tent next to mine screamed until it was explained to them that this grunting monster was, in fact, the camp’s tame mascot. We then left in our jeep before sunrise and headed off to Musiara Marsh. The area was full of wildlife. I thought we had landed in Jurassic Park, but no, this was the Masai Mara, and since then I have suffered from an incurable illness which I call ‘Africa Fever’. The person who used to inhabit my body was long ago gobbled up by hyenas somewhere between Ngorongoro, the Serengeti, and the Masai Mara. And all this because of a river: the Mara that gave the region its name.

The Mara carries water all year round and is one of the most important sources of life in the entire Serengeti ecosystem. Its short, 250-mile course provides the Masai Mara and the North Serengeti with water before it flows into Lake Victoria. Agriculture has robbed the river of enormous amounts of water to the north of the Masai Mara, but this usage has been reduced recently in order to protect the environment. Many scientists believe, should the Mara be reduced to half its current volume, that the entire Serengeti ecosystem as we know it today could no longer exist. The gnu migrations would cease due to a lack of water and fresh grass, and the reduced habitat would lead to a huge drop in the gnu population. This would, in turn, decimate the populations of the predators that depend on the gnu herds for their survival. The Mara River presents a huge barrier to the gnus during their annual migration, but it simultaneously their main source of life, as well as the crux to the survival of the entire Serengeti ecosystem.
9.2 River Crossings—Palpitations at the Mara River

Even after years of photographing river crossings, I still get palpitations whenever I get to witness this spectacle, and I probably always will.

In reality, it is impossible to photograph this natural drama in all its overwhelming intensity. In my opinion, it still has not been adequately filmed. The spectacle spells death for the gnus that are crushed or drowned, it is brutal and bloody for the animals that fall prey to crocodiles, but it is nevertheless a triumph for all the animals that reach the fresh grass on the opposite bank. It is simultaneously saddening to hear the cries of the gnu calves that have lost their mothers and a joy to witness the happy bleating of the families that are reunited on the other side. The whole show appears as if 20,000 cow-sized ants are trying to force their way through the eye of a needle. And it is very, very loud. A Serengeti river crossing is simply the greatest natural spectacle on the planet.

The drama usually begins about two hours after sunrise when the air starts to get warm. The gnus gather in ever greater numbers and move up and down the riverbank like a great army, searching for a ford. The most impressive crossings take place in the southern loop of the river where the banks are too steep for the gnus. Here, they choose the places normally used by hippos to enter the river on the inside of the river’s curve, where the water is shallower and flows more slowly. The gnus often drift a long way at the opposite bank, forced off course by the stronger current in the deep water at the outside edge of the river bend; they often drown or are snatched by crocodiles while searching for a way up the riverbank. But they don’t give up. The herd simply keeps coming, and an inexplicable inner force causes masses of gnus to jump to certain death. A river crossing begins slowly when the first few gnus gingerly try a cleft in the bank, but quickly becomes an unstoppable run.

As soon as the first gnu has successfully crossed, the pressure within the herd grows until they all seem to want to cross at once. At first, the entire herd follows the first few gnus until the pressure becomes so great that other crossing
points have to be found. Once the run has started, other herds that are grazing in the area join the throng, dramatically increasing the pressure on the animals already at the riverbank. The largest river crossing ever witnessed took place in the Masai Mara in August 2008, when an estimated 100,000 gnus took about 10 hours to cross the Mara.

River crossings often last several hours, with the drama increasing as time goes on. You should work with your longest telephoto lens from a tripod, or from a tripod head mounted on the roof rails of your vehicle. Cover your camera to protect it from heat and dust when you are taking a break or while you are taking overview shots with your other camera. Always wear a hat to protect yourself against the heat.
Gnus generally use shallow fords where the river bed is stony, as they are better protected against crocodile attacks. This behavior appears, however, to be entirely instinctive, as gnus show no direct fear when crocodiles suddenly surface. Most of the natural fords are too narrow for the sheer number of gnus that want to cross, and many fall victim to crocodiles while swimming to deeper parts of the river. Crocodiles rarely ambush gnus in the shallow fords, as they run the risk of being trampled by the gnus' hooves.

River crossings are difficult to photograph in bright sunlight, and the Masai Mara winds often stir up dust, making the situation even more complicated. The combined factors of dust, haze, and the extremely high contrast produced by the foaming water make it impossible to rely on normal or automatic exposure metering. The best way produce well-exposed images is to take test shots or to shoot bracketing sequences, secure in the knowledge that you can correct
many exposure errors later at the post-processing stage. You should also clean the front element of your lens at regular intervals.

When the river gets so full that the water appears to be boiling, the pressure on the riverbanks is so great that the hippo paths are no longer wide enough to channel the masses of gnus. They then begin to leap into the river—first from the riverbank itself, and eventually from the scarps overhanging the river so that they often land directly on the gnus already crossing. This behavior results...
The perspective for most river crossing shots is less than perfect, as you will always be shooting from above. You can only get a better perspective if you use a water- and shockproof remote-controlled camera mounted near the ground on the riverbank. Getting permission from the park administration to use this type of equipment is not easy.

Photographing river crossings requires you to be capable of “multi-tasking.” You will need to simultaneously keep an overview of the situation while constantly checking the huge supply of photogenic scenes for the best opportunities. A third eye for checking up on crocodiles wouldn’t be a bad thing either, as these great lizards are often only visible once they break water to attack.

River crossing:
Masai Mara, September 2006
Nikon D2x, AF-S VR 200-400mm f/4 lens, ISO 100, 1/250 sec. at f6.3

in broken bones and other serious injuries. The Mara River rapids are always full of dead and drowned gnus, and the shallower water near the southern Mara bridge is, at migration time, full of thousands of decomposing gnu cadavers that produce an almost intolerable smell. Nevertheless, these losses appear to have no lasting influence on the gnu population as a whole.
Seasonal Migration
August-November

Gnu leaping during a river crossing:
Masai Mara, September 2006,
Nikon D2x, AF-S VR 200-400mm f/4 lens, ISO 100, 1/250 sec. at f6.3

Gnu leaping during a river crossing:
Masai Mara, September 2006,
Nikon D2x, AF-S VR 200-400mm f/4 lens, ISO 100, 1/320 sec. at f5.6

River Crossings—Palpitations at the Mara River
**Seasonal Migration**

August-November

Stitched panorama image of a river crossing:
Masai Mara, September 2007, Nikon D2x, AF-S VR 70-200mm f/2.8 lens, ISO 100, 1/250 sec. at f5.6

Sequence of a leaping gnu during a river crossing:
Masai Mara, September 2006, Nikon D2x, AF-S VR 200-400mm f/4 lens, ISO 200, 1/400 sec. at f4.0

**Photo opposite**
Crocodile attacking a gnu calf:
Masai Mara, September 2007, Nikon D2x, AF-S VR 200-400mm f/4 lens & 1.7x teleconverter, ISO 320, 1/250 sec. at f6.7
Always try to photograph leaping gnus as a complete sequence using a fast motor drive.

Don't forget to shoot some context shots; otherwise you will have difficulty telling (and selling) the whole story.

Try to keep an eye out for crocodiles preparing to attack.
9.3 Party Time for Vultures

During the gnu migration, it is often worth taking a drive in the otherwise uninteresting midday heat to the areas down river from the gnus' crossing points. You will nearly always find a clamor of vultures, hyenas, or crocodiles fighting over a gnu cadaver. There have even been reports in the Mara River area of lions and crocodiles eating a freshly drowned gnu together without showing the slightest sign of their usual hostility towards each other.

Without wishing to insult the builders of early digital cameras, I have found that the lack of technology can sometimes result in superior photos. I photographed this vulture using a relatively long shutter speed and a wide aperture.
due to the limited noise-reducing ISO scope of an earlier digicam. Nowadays, I would probably take a photo like this using my D3 set to ISO 1600 and 1/2000 second at f11.0. The result would be pin-sharp and probably quite dull.
Lappet-faced vultures are the most powerful and aggressive of the vulture species in East Africa. They generally live in pairs and are often the last scavengers to arrive at a cadaver. This is tactical behavior that allows other vultures to pick over the cadaver first, leaving the stronger lappet-face to snatch the best pieces of meat from their rivals. Lappet-faced vultures not only scavenge for food but are also hunters, quite capable of killing an animal the size of a young gazelle. Incidentally, I find that an approaching lappet-face reminds me of an old biplane coming in to land.

It is often worth waiting when you are observing lappet-faced vultures, as they do the strangest dances, costumed in their cape-like feathers. They will often stop in mid-dance to head off to a nearby cadaver and grab the best-looking piece of meat, which they will then eat alone, away from the rest of the birds.
9.4 Hippos—Big and Dangerous

The cute, cuddly hippo behavior that the advertising industry likes to sell us simply doesn’t exist. Hippos are some of the most dangerous animals in Africa, involved in more fatal accidents than all other African predators put together. Hippos are aggressive when they are in the water but become really dangerous when they are grazing or if they are surprised on the riverbank. Their sharp teeth are quite capable of biting through a human body. I had a scary experience in early 2001. I decided, with typical male curiosity, to step directly into the Mara, and managed to completely overlook a hippo that was resting nearby. Now at least I know how quickly I can jump into a jeep in an emergency! So please, please never go too near the riverbank. And don’t ever take risks in Africa, however small, especially when you are new to the region.

Until recently, hippos were thought to be herbivores, but recent observations have confirmed that they eat gnu meat. Nowadays, biologists believe that hippos are also capable of infanticide and cannibalism.
This photo shows, once again, the typical, dull midday light in the bush, with its almost 90 degree angle of incidence and heavy shadows. I lightened the shadows for printing using Photoshop Levels. It is, unfortunately, not always possible to wait for the right light in the wild.
I hadn’t wanted to believe how aggressive male hippos can be to their own young in spite of one lodge owner’s story of a Mara River bull biting a baby in two. But, in September 2007, above the Olare Orok Double Crossing (a ford leading from the Talek area of the Masai Mara towards Rhino Ridge), I witnessed a similar scene. In the wild, it looked as if the bull hippo simply wanted to chase the baby off, but later, while I was sorting my photos, I realized how deep the bull had sunk its teeth into the baby, and how much blood was left on its teeth.

Although many drivers rush from area to area and animal to animal for the sake of the tourists, this sequence shows how little being in a hurry helps when it comes to producing great photos. A serious wildlife photographer needs to
be calm and patient, and needs to retain his composure so as not to constantly feel that something more interesting might be happening somewhere else. If you observe a particular animal long enough, you will nearly always discover something new that you have never seen or photographed before. It took me about three years on photo safari to learn not to succumb to the pressure of my own curiosity.

One of the rare moments in the wild when everything ends peacefully, at least for the moment. Once the baby hippo had escaped from the bull, it took a drink of water to calm down.
9.5 Giraffes—Slow Motion Rivalry

If you come across knotted bull giraffes in Africa, they are probably not doing yoga, but are more likely competing for a female’s favors. While fighting, they take great swings at each other’s heads and necks until one of the pair gives up and retreats. This ritual is nature’s way of ensuring that only the strongest animals get to reproduce. Giraffes move (and attack) very slowly when fighting and fortunately, apart from the odd bump or concussion, their fights usually end without injury. A giraffe fight appears to take place in slow motion and can go on for hours. The rivals often appear not to notice when the object of their desire simply moves on and leaves them to it.

In spite of an apparent sluggishness that the sheer size of the animal seems to infer, a giraffe knows very well how to defend itself against hyenas and lions (its main enemies). A kick from a giraffe can easily break an adult lion’s back. Giraffes are at their most vulnerable when they are drinking, as they have to perform four-legged splits in order to reach the water with their mouths. They need a few seconds to orientate themselves after drinking or resting, and in those few seconds a lion can get near enough to place a deadly bite to the giraffe’s neck.

Neither the light nor the background were really ideal here, but the “dance moves” the bull giraffes performed during their tussle were nevertheless wonderful to behold.
Giraffes are peaceful animals, and, with the exception of their predators, appear to get along well with all other animals. I have never seen signs of conflict between giraffes and gnus, buffaloes, or zebras. It is even possible that other animals deliberately stay near giraffes in order to benefit from the “early warning system” that their superior height provides. Only elephants occasionally chase giraffes away from water holes.

It is always worth observing giraffes, even at quieter times of day. They often provide interesting and comical photo opportunities like the one above, or the almost Dali-esque view below. Photographing giraffes is also a good opportunity to give your arm muscles a break from your biggest lens, as a 70-200 mm lens is usually the best option.
After reading Jonathan Scott’s fantastic book *The Kingdom of Predators* in the 1990s, I thought the Masai Mara must be some kind of zoo, with every predator having its own individual name. But the Masai Mara is not a zoo, and it covers an area of nearly 700 square miles. If you include the North Mara and the Loita Plains in the northeast, the region forms an enormous, integrated wildlife reserve.

But, in fact, all the adult big cats do have names. This practice has a long tradition, going back to the names given the big cats by the driver/guides in the 1970s when the Masai Mara was first developed as a tourist destination. When the BBC series “Big Cat Diary” (currently being filmed under the title “Big Cats Live” in the Masai Mara) was first broadcast, they continued to use these names, which became world famous as a consequence.

The photo on the left shows the dominant male of the Marsh pride, a group of lions that lives in the Musiara Marsh area. This fine specimen managed to unite his group with two other prides and is the best-looking black-maned lion in the Masai Mara. He is called “Pavarotti” due to his (supposed) similarity to the late opera star. Pavarotti arrived with two brothers (or companions) as a nomad from the Serengeti in the summer of 2007, and has injected fresh blood into the lion population of the Masai Mara. These three have killed or chased off two dominant males in the area and have rejuvenated the blood lines of a population that was in serious danger of inbreeding.

When I heard about his arrival, I immediately flew out and discovered him a couple of days later looking clean and fresh after a shower of rain. I have followed him ever since, either live or on the Internet. He spent a while recovering from serious injuries received during his fights with other dominant males in the area, and has since fathered at least 10 young of his own.
The female cheetah “Shakira” was one of the stars of the BBC’s autumn 2008 series on the Masai Mara. During filming, she gave birth to a litter of six cubs—a rare occurrence. Unfortunately, three of her litter have since died.

If you want to observe and photograph predators live for the first time, go straight to the Masai Mara in Kenya and save yourself the effort of visiting other less interesting parks. No other region of the world has as many predators that you can observe at such close range. Once you have gained some experience in this small region, you can set out into the much larger and just as beautiful Serengeti. Experience helps you estimate the risks involved in more remote areas of the Serengeti, where help can be three hours away by plane. I spent two years in the Masai Mara acclimatizing myself (not least because of my extreme snake phobia) before I ventured into more remote and dangerous areas. The more remote your location, the more often you will have to leave the protective cocoon of your vehicle, and it is vital to know when it is safe to do so.
The black-maned lion in the photo at left is the former leader of the Marsh pride who was driven off by Pavarotti and his crew. The two cuddly-looking young lions in the photo below are so-called “nomadic” lions that were driven out of their pride at the age of two to two-and-a-half years. Later, when they are four or five years old, they too will attempt to take over an existing pride. These battles for dominance are tough and relentless, and it is said that male lions always try to break their rivals’ spines. Their manes are said to serve as protection during these fights. I have not yet been able to test this theory, as I have never seen a battle between two lions in the wild. Photos of fighting lions are extremely rare, so if you do manage to capture some, you are guaranteed a worldwide market for your images.
9.7 Honeymooners—Lions and Sex
Like all other big cats, lions do not have a fixed mating season. If you want to take photos of copulating lions (driver/guides usually call the act "honeymooning"), you will have rely on coincidence or photographer’s luck, although certain events can lead to “the right place at the right time”. If, for example, you hear that a new dominant male has recently taken over a pride, the chances of catching him mating increase enormously. The local drivers in the Masai Mara are usually
well-informed about these kinds of things, and nowadays, there are very good maps on the Internet that pinpoint the locations of particular lion prides to within a few tens of square miles. A new dominant male will kill all surviving cubs in the pride in order to ensure that only his blood continues the line. This behavior is brutal but effective in nature’s fight against inbreeding. Lionesses very quickly come in heat once a new dominant male has killed their young, and
the honeymooning couple then withdraws from the rest of the pride—often to a great distance—for up to two weeks while they mate. Mating lions will copulate approximately every 20 minutes for the first six to eight days of this period, and at longer intervals thereafter. If the happy couple isn’t surrounded by packs of tourist jeeps, you will have time to select the best scenes to photograph. In the high season, you will need to wait for the quieter period around lunch or return to the scene later to get your best shot, and your patience will once again be rewarded with hard midday shadows. If you are lucky, you will be able to
catch your subject “in flagrante” in the more pleasant morning light of the next
day before the tourists arrive. I have yet to come across mating lions outside of
the high season. I have only ever found pairs of lions when they were surrounded
by tourists, and I then had to photograph them in the midday sun.

This pair of lions had disappeared without a trace the following morning, and
I gave up searching for them after a couple of hours. I nevertheless included the
photos here for documentary purposes, and to demonstrate that it is worth
looking for copulating as well hunting lions in the early mornings. This partic-
ular “show”, with all its yelling, grimacing, and general clamor, was definitely a
highlight. And by the way, a majority of the scratches and scars that you see on
older male lions’ faces are caused by the females of the pride during mating, not
by other males fighting for dominance.
9.8 Lion Cubs at the Double Crossing
The Double Crossing is a ford that leads northward from the Talek River region in the Masai Mara, and every time I am there I find lionesses with their young. Lionesses will usually give birth to between three and five cubs at intervals of two to two-and-a-half years. They withdraw to a secluded hideout to give birth and for the first six weeks of their cubs’ lives. These hideouts are usually in bushy areas or thickets near riverbanks or marshes where the young mothers can hunt from under cover. The area around the Double Crossing offers perfect conditions for bringing up young lions. Lion cubs, unlike leopard cubs, are extremely lively, and are difficult for their mothers to keep under control.
First-time lion mothers often lose their broods due to inexperience, but older, more experienced lionesses defend their young to the end, even against much stronger males. Most lion cubs do not survive their first year, either falling victim to predators or being trampled to death by elephants or buffalo. A lion has only enemies, sometimes including its own father.

Once they return to the pride, lionesses share the raising of the young and even suckle each other’s cubs. The cubs of big cats appear particularly cute to us humans because their pupils remain wide open for the first few months of their lives. Once they reach adulthood, their pupils close down to slits, making them appear cold and sometimes vicious. Although lions are the only big cats that display social group behavior, the hierarchies within prides (including the standing of dominant males) have still not been documented and explained with absolute certainty.

Cubs and young lions can be found all year round in the Masai Mara, and the monthly game report on the Governors’ Camp website is a very good source of information concerning animal movements. There were comparatively few lion cubs to be seen in the summer and autumn of 2007, when Pavarotti and his companions had killed most of the surviving young during their takeover of two regional prides. In September of that year, there were only two lionesses with young in the entire area between Talek and the northern Mara bridge. They hid themselves so well that even the most experienced drivers had trouble finding them.
Photographing leopards in the wild requires great patience. Don’t be deceived by the many “action” photos shot in front of dusty or stony backgrounds that you can find on the Internet. These photos are mostly of tame leopards taken on farms in Namibia or South Africa. Leopards creep up stealthily on their prey and are not easy for the untrained eye to spot, whether in trees, in the bush, or in high grass. If you are inexperienced, or if your driver is not one of the best, you will have to leave it to luck to get your photo. If you discover fresh spoils up a tree, as in the photo below, your luck is in. Stay at least 300 yards from the spot, preferably under natural cover, and wait. The leopard will always return to its meal at some point, although this can be at dusk or during the night.

Leopards are extremely strong. They can drag their prey for long distances and hide it in high trees, even if it weighs significantly more than their own body weight. Their greatest enemies are lions, which will kill any leopard they can get close to. Lions sometimes even surround a leopard’s tree until the leopard loses its nerve and descends to certain death. Leopards do not, as is sometimes reported, leap on their prey directly from trees, but first creep up as near as possible on the ground before making their final attack.

Leopards usually eat gazelles, impalas, and other similar, large ungulates and their young. But they are adaptable and omnivorous, and will eat fish, domestic...

A leopard's spoils are often easier to spot in a tree than their owner. You will usually only be able to see the leopard's tail hanging down, and even that is hardly visible to the naked eye.

Leopard in the evening light: Masai Mara, September 2006, Nikon D2x, AF-S VR 200-400mm f/4 lens & 1.7x teleconverter, ISO 320, 1/60 sec. at f.6.7
Seasonal Migration
August-November

Leopards at the Talek River

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animals (especially dogs), and even the refuse that collects at the perimeters of human settlements. In India, there have been reports of leopards taking human babies and small children from the balconies of apartment blocks in the satellite towns that have sprung up in the leopards' traditional hunting grounds.

This leopard wanted to grab a young baboon from a group that was taking a break at the Tarek River, a well-known leopard habitat in the eastern Masai Mara. Hunting baboons can be dangerous for leopards, as a full-grown baboon is just as strong as a leopard and has canine teeth that are just as sharp. Sometimes, large groups of baboons turn the tables, and chase and kill leopards themselves.

When you are following and photographing leopards, especially at dusk, agree with your driver in advance on specific directional commands. “Over there in the bush” isn’t very helpful when all you can see is bushes and your view through the viewfinder with a 500 mm or 600 mm lens is only a few degrees wide.
What you see here is a typically poor crop of photos after a day of photographing a leopard. The main photo is quite acceptable, but it appears slightly unnatural due to the fill-in flash I used to brighten the gray dawn light. This female had hidden her two young near a tree and was at first impossible to see in the bush. She then appeared suddenly less than a yard from our jeep—I could almost have stroked her with my 200-400 mm lens, but photographing her at such short distance was impossible. Sometimes, photographer’s luck simply doesn’t hold; in this case, my other camera with its shorter lens was too far away to reach in time. My partner managed to get a fairly sharp shot using her D40x and a standard zoom. The leopard then lay down in the long grass with her young, which resulted in the (almost unusable) photo on the left. She then disappeared again and turned up a couple of hours later to rest in a tree some miles away. She stayed there until sunset while we hid behind a nearby hill and boiled in the sun. At the end of a day like this, I sometimes end up asking myself if it might not have been a better idea to … maybe … photograph lions?
9.10 Cheetahs at Rhino Ridge

If you want to drive from the Talek River in the east of the Masai Mara to the Musiara Marsh in the north, you automatically pass Rhino Ridge. This area in the northeast of the Masai Mara, together with the neighboring Paradise Plains in the west, is a great area for photographing cheetahs. The best time of year is towards the end of the Great Migration (from the middle of October onwards). By this time, the ungulate herds have grazed the savannah bare, making cheetahs easier to spot. If you use your binoculars to look for potential cheetah prey, you will often have the chance to prepare in time and photograph the hunt from close up.

As a non-scientist, my best guess is that a cheetah can spot prey the size of a gazelle kid at a distance of two to three miles. We followed this cheetah for a mile and a half from her lookout before we realized she had locked onto a gazelle kid hidden in the long grass. The mother gazelle was only able to watch in horror as her one-day-old baby fell victim to nature. The cheetah killed the gazelle with a bite to the neck on the way to its hideout, and then ate greedily, hidden in a nearby bush. While she was eating her meal, she suddenly set off again at

![Cheetah on the lookout for prey: Masai Mara, November 2005, Nikon D2x, AF-S VR 200-400mm f/4 lens & 1.4x teleconverter, ISO 100, ¼ sec. at f5.6](image)

![Cheetah and gazelle kid: Masai Mara, November 2005, Nikon D2x, AF-S VR 200-400mm f/4 lens & 1.7x teleconverter, ISO 100, ¼ sec. at f7.2](image)
enormous speed and returned a few seconds later with a rabbit. None of the photographers present was quick enough to capture this second chase. On the following day, I discovered that “our” cheetah had recently given birth to three tiny cubs, which explains why she was so hungry the day before. Before I was able to even think about photographing the young cheetahs, the park rangers sent us packing and sealed the whole area so that the cheetah could deal with her young in peace. Protecting the animals and their young is still everyone’s #1 priority in the Serengeti, even if it means missing a potential one-in-a-million photo.

Unlike other big cats, a cheetah is built purely for speed. Its body is thin, and its legs are proportionally much longer than those of other big cats. While leopards and lions have strong forelegs and neck muscles, the front half of a cheetah’s body is almost petite in comparison. However, a cheetah’s hind legs are
extremely strong, with well-developed muscles helping them to reach great speeds while running. If you are photographing a running cheetah, always be ready for it to accelerate to chase speed at a moment’s notice. Most autofocus systems are not fast enough to keep a cheetah running directly at the camera (at up to 65 mph) in focus.

Cheetahs hunt during the day and usually rest in a bush or under a tree at sunset in order to avoid falling prey to lions and their superior night vision. This behavior gives us wildlife photographers a much greater chance of actually getting to snap a cheetah while it is hunting, although you still need patience and
Time-line
Seasonal Migration
August-November

The cheetah “Princess”:
Masai Mara, December 2003,
Nikon D1x, AF-S VR 70-200mm f/2.8
lens, ISO 100, ½ sec. at f9.0

Cheetahs at Rhino Ridge 203
**Cheetahs at dusk:**
Masai Mara, December 2003,
Nikon D1x, AF-S VR 70-200mm f/2.8 lens & 1.4x teleconverter,
ISO 100, 1/125 sec. at f5.3

**Cheetahs with prey at dusk:**
Masai Mara, October 2005,
Nikon D2x, AF-S VR 200-400mm f/4 lens, ISO 360, 1/250 sec. at f4.0
some luck if you want to be at exactly the right place at the right time. Cheetahs have an approximately 35 percent success record when hunting and need to rest, sometimes for hours, after every failed attempt. During this time, you simply have to wait.

In the Masai Mara, it is often possible to follow the lives of individual animals over periods of several years. The three male cheetahs in the photo on the left are the young of the cheetah called Princess, mentioned earlier in the section “Big Cats with Their Own Names”. At the time the photo was taken, they were about two-and-a-half years old and Princess was already dead; but she had obviously managed to teach her offspring all they needed to know to survive in the wild. They are clearly capable of killing an adult topi or gnu as a group. At the time of this writing (spring 2009) these three were still in good health.

Cheetahs kill with a suffocating bite to the neck, with which they also try to open their victim’s jugular vein. Ninety percent of a cheetah’s daily fluid intake comes from the blood of its victims, and they need very little water to survive. For this reason, cheetahs were used in earlier times in India as trained hunters. The cheetah was allowed to drink the blood of the animals it killed, while the meat remained the property of its master who, in return, fed and housed the cheetah.
9.11 That Elusive Cover Picture, or Camping in the Rain at the Mara River

In the summer of 2007 I was on the lookout for a cover photo for a children’s book about lions. I had planned to use an existing image of a lioness with her young, but the publisher insisted on a picture of a male lion with a flowing mane, as he wanted to get boys interested in the book too. I already had a large number of images of male lions, but none of them were child-friendly. My publisher wanted a grand, proud-looking lion with a friendly face—i.e., he wanted a picture of a nonexistent, mythical beast. I had already planned to spend September of that year in the Masai Mara photographing river crossings and Pavarotti, the newly-arrived, black-maned dominant male lion. Maybe I could pour a little pepper on his tail and snap the friendly-looking picture my publisher wanted. So there I was, waiting to hear that the gnu herds from the Serengeti’s Western Corridor were starting to arrive in the Masai Mara, where I could catch them at the crossing in the southern loop of the Mara River.

Then came the message “In three or four days”. I immediately booked the cheapest night flight I could find to Nairobi and emailed my friend Denis from DM Tours in Mombasa that I would be arriving in Nairobi at seven in the morning in three days’ time, and that he should get everything organized for a week’s Masai Mara tour. Driver and vehicle presented no problems, but the camps and lodges I wanted to stay in were all booked up. Denis nevertheless managed to find a full bed-and-board camping lodge with a tent, three meals a day, outside bathroom and showers, run by a German, and ideally located near the Mara River—and all
for US$80 per day. The camp was still being built, but the price was OK, so I booked it and emailed the camp directly to make sure that there was enough liquid (i.e., Tusker beer) on hand.

Ali, our driver from Mombasa, found Nairobi, the airport, and us; and together we found the Masai Mara and our camp. The location was fantastic, the food was great, and a contraption made of blocks of coal and wire doused in water made a surprisingly good beer cooler. Everything else was pure adventure!

But that is what I like about Africa. In fact, I think I need a little bit of real wilderness to keep my senses sharp, and to make life more interesting than it is when crossing the road back in civilization. And wilderness is what I got.

The sleeping tents were modestly sized for two people plus camera gear, and a small igloo tent was set up outside for our clothes. The water bags hung up in the trees made acceptable showers, but we had to make sure that there weren’t any monitor lizards nesting in the rush screens before we let the water flow.

But hey, that’s Africa. The hissing and growling noises in the night that made me use the bush next to my tent rather than the camp bathroom turned out to be a leopard, not a beer-based hallucination as I had first thought. Fortunately, leopards don’t seem to like my aftershave. Our Masai lookout, who had slept under a tarpaulin by the fire, apologized and said that he had only ever seen the leopard in question on the opposite bank of the river. But the leopard had obviously made an impression; the next night saw a new fire glowing about 20 yards from our tent (where most of the footprints had been found), and our guard had been joined by two of his fellow Masai for the night. For safety, I screwed a ball head onto my heaviest monopod and laid it next to my bed. This helped me to feel slightly less insecure behind the thin walls of my tent, just in case the leopard changed its mind about my aftershave.

Before we started our search for Pavarotti, I made my traditional trip to the west bank of the Mara River. As soon as the first shooting light shows, I head off from the Oloololo Gate towards Little Governors’ Camp, where I always find lions (and, if I am lucky, leopards) in the area near Serena Lodge. If the weather is clear, I can see almost half of the entire Masai Mara and the movements of the great herds from my vantage point at Serena Lodge. From there I move on to the south loop of the Mara River, where I nearly always find cheetahs and sometimes leopards. My first stop is my favorite picnic tree at the border with the Serengeti National Park in Tanzania, from which I can see far into the northern Serengeti. On this particular day, the long lines of migrating gnus appeared as if to order, moving towards us in the direction of the Mara River. An older driver/guide from the Kichwa Tembo Camp estimated that there were about 250,000 animals in the group, the first of which would reach the river the next morning. So Pavarotti would have to wait for a day or two while we photographed the upcoming river crossings.

The only problem was that it started to rain—very unusual in September—and continued to rain for several days. Photographer’s luck turning into photographer’s bad luck! I was forced to take photos of river crossings without the usual dramatic dust, and often under conditions which were too dark to use my...
longest lens without producing excessive image noise. Every now and again, the sun would shine through the clouds, providing me with a temporary, hard light, but this light produced such high contrast wherever water was present that I might just as well have switched my camera off altogether.

During my breaks I deleted 90 percent of the photos I had just taken. Not only that, but news of the huge herds had got around the whole Masai Mara, and I was now surrounded by about 50 other jeeps jostling for position on the banks of the Mara River. A year before I had shared the same viewpoint with just four other jeeps, but this time, the rangers had a tough job making sure the tourists left enough space for the gnus to get across the river at all. On the second afternoon, the rain intensified and was now accompanied by heavy thunderstorms. One small consolation was the fantastic light that the sun produces when it breaks through the storm clouds—a great substitute for the classic “golden light” that you don’t get to see during storms.

Another problem when it rains in the Masai Mara is the “black cotton soil” that makes up much of the ground, and that behaves like a mixture of modeling clay and engine oil. Heavy rain turns the jeep tracks into mush within minutes, and vehicles slither around uncontrollably as if on ice, even in low gear and with differential locks engaged. The jeeps that are permanently stationed in the Masai Mara always have appropriate tires, but our eight-seater Toyota Land Cruiser was much too heavy and was fitted with low-grade, all-weather tires. We gave up and started on the 25-mile drive back to the northern Mara bridge at 4 p.m. Apart from a few involuntary slides, we got through OK, but the track was closed from the Serena Lodge onwards, and we had to take an alternative route through the marshland along the banks of the river. Fortunately Ali, our driver, didn’t know what he was up against, otherwise he would have suggested that we stop for the night at Serena Lodge.
We had only managed a mile or two more by 5:30 p.m. as it began to get dark, and we couldn't see any other cars or rangers anywhere. We even managed to get stuck in the mud twice in the middle of an area populated by leopards and lions, forcing us to leave the jeep to find stones and branches to jam under the tires. Eventually, we were joined by some jeeps with cross-country tires returning to Kichwa Tembo Camp. One of the drivers understood our problem and laid a new track through the mud for us. It was about 7:30 p.m. by the time we got back to our camp, which had by then turned into a living wetland bog. And the rain went on. We only had to walk a couple of yards before the clay under our feet caused us to slide around uncontrollably. We were cold and soaked through, so we took a hot shower in the open in the pouring rain—also a completely new experience. We managed to find a few dry clothes in our hard cases, although our other clothes (in the igloo tent) were soaked. At least our sleeping tent was watertight above the beds. My snake phobia took second place to hunger as we slid through the mud to the restaurant tent in our flip-flops, where two new rivers full of frogs and other small creatures greeted us. I asked Peter, the lodge owner, whether he didn't perhaps feel like digging a trench around the tent to keep the snakes from joining us for dinner. Peter obliged, and we eventually sat down to eat. I don't honestly remember much about the rest of the evening, but I did have something of a hangover when I got up at 5 a.m. the next morning. Peter only remarked at breakfast that he would have to visit the nearest town at the next opportunity due to a lack of alcohol in camp.

But now it really was time to look for Pavarotti, whatever the weather. We took a tall Masai called John (our night watchman's uncle) with us. He said he was a safari guide and offered to lead us to Pavarotti for a mere $10 a day.

We took a stone track through the Masai fields and on to the Musiara Gate in the eastern Masai Mara. On the way, we saw three other jeeps parked on a hill-ock and stopped to take a couple of pictures of some fur in the high grass. “I'll save that leopard for tomorrow,” I thought. John wanted to head off to the right at the Musiara airstrip, as he was convinced that Pavarotti and company were still on the move. We nevertheless turned off to the left in the direction of the Miti Mbili lugga (a river/swamp area that sometimes runs dry). This is a place where I nearly always find members of the Marsh or Bila Shaka prides, and these were the groups that Pavarotti supposedly now controlled. A few minutes later, our Kenyan driver, Ali, got to see his first pride of lions from close up. He was suitably impressed. But there was no male to be seen in the group—
maybe John was right after all. John said he wanted to take us on a short cut down an old track that he knew, and within five minutes we had a green rangers' car in front of us and a uniformed guard carrying an old Lee-Enfield rifle in our jeep. I asked him politely to keep the barrel pointed upwards—you never know when such an old piece might go off (if it's loaded at all, that is). We were then escorted to the ranger station at Governors' Camp, where we were fined $50 for illegal off-roading.

At this point it was “goodbye morning light”. John then led us over Rhino Ridge into the Talek region to the Double Crossing, and on to the border with the Masai Mara. We managed to take a few nice photos of a cheetah along the way, but there were no lions to be seen anywhere. After our siesta, I had John turn around and head back to the Musiara Marsh, as I was sure our three lions had to be there somewhere. We then came across James, a driver who had guided me through the Masai Mara two years previously, and who told us that Pavarotti and his two friends could be found about two miles to the south at the foot of the Miti Mbili lugga, where they were trying to flush out a lioness from the Marsh pride who had hidden her young there. These cubs were the offspring of the previous leader of the pride, and Pavarotti obviously wanted to finish them off so that his new bride would come into heat for him. Pavarotti was recognizable at the time by the relatively few facial injuries he had. It seemed as if my early morning instinct had been right all along, and we then only had to follow the lugga for another two or three miles to the south.
The weather began to clear, so we set off immediately. After a short search we found our heroes, looking like drowned puddles after the rain. All three lions had black manes, but one had a particularly impressive haircut and also comparatively few scars on his face. It was Pavarotti. Now all we had to do was wait until the sun and the wind dried his mane. There were no other jeeps in the area, so we (illegally) used a hyena call to wake the lions, who leapt up and started to search for the phantom enemy. We stayed stock still for an hour and a half in order to avoid the lions stumbling across us on their search for a non-existent hyena.

The weather had ensured that there were no other tourist jeeps in the area, but we hid our jeep anyway so that it couldn’t be seen from too far away. Lone jeeps in the Masai Mara tend to attract others the way a lamp attracts moths at night. Pavarotti was by this time nearly dry, and the remaining moisture made his mane glow almost as if it had been varnished. All it took was a quick hyena imitation to get him to sit up. He turned his head first to the side and then slowly, with a proud, almost benign expression on his face, he looked straight into the camera. Long lens in place, aperture open, short shutter speed, and off goes the motor drive. Bingo! Thanks for the memory, my lion friend.
I had at last achieved my goal for the trip, and I spent the next day in bright sunshine, happily photographing the leopard you can see on page 198.

We spent the last night celebrating my 40-something birthday, and my guardian angel did sterling service on the following day, too. It had rained again in the night and we were fighting our way through the mud outside the park borders on the way to Leopard Gorge. An English photographer had told me that another lioness from the Marsh pride was hiding her young from Pavarotti near a ford in a lugga a short distance away. We found the ford after a two-hour
search and managed to get our jeep completely stuck in the mud in the process. I knew the lioness had to be here somewhere, and I suddenly spotted a bundle of fur through my telephoto lens about 70 yards away between the dips in the lugga. I reckoned I had about three or four seconds to get back to the jeep if she attacked. Ali looked at me and said, “Not me Uwe. They’re your lions, not mine”. So I opened all the jeep’s doors and got out to look for stones while Ali stood in the sunroof, ready to shout if the lioness so much as moved a muscle. I climbed carefully out of the car and immediately fell flat on my backside, followed by a dramatic leap back into the jeep. It is difficult to behave more stupidly (i.e., apparently aggressively) if you happen to be near a lion. But Ali said, “Everything’s quiet. She’s still lying there where she was”. So I got out on the other side of the jeep and collected some stones from 20 or 30 yards away. I hoped for the best and comforted myself with the thought that I’d never wanted to be 50 anyway. On the way back to camp, I became convinced that the lioness must have somehow liked me—but luckily not the way I taste.
Information
Addresses and Links

Current Wildlife Information from East Africa

www.governorscamp.com
Traditional Safari camp in the Masai Mara with monthly wildlife reports

www.jacksonlooseyia.blogspot.com
Wildlife keeper Jackson Looseyia's daily blog from the Masai Mara

www.wildwatch.com
Daily reports from almost all of the wildlife protected areas in Africa

www.bbc.co.uk/bigcat/about/
Very informative website by the BBC about cats of prey in the Masai Mara

www.msuhyenas.blogspot.com/
Daily blog about Michigan State University's hyena research in the Masai Mara

www.safari-portal.de
Bwana Mitch's safari site, ideal for travel planning with links to almost all travel providers and accommodations in East and South Africa

Wildlife Protected Areas and Animal Protection Organizations in East Africa

www.serengeti.org
The official website of the Serengeti National Parks

www.tanzaniaparks.com
Tanzania National Parks' official website with descriptions of all the parks and current entrance fees

www.maratriangle.com
Website containing current information from the west side of the Masai Mara

www.kws.org
Kenyan Wildlife Service's official website with descriptions of all the parks and current entrance fees in Kenya

Internationally Operated Animal Protection Organizations

www.zgf.de
Frankfurt Zoological Society's website

www.awf.de
The African Wildlife Foundation's website

www.wwf.org
The World Wide Fund’s website
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