

Photographing **FROGS**

and Other Amphibians

By Robin Hoskyns

With contributions from:

Ariadne Angulo, Candace Hansen-Hendrikx, Clay Bolt,
Phil Bishop, Robin Moore and Brian Gratwicke

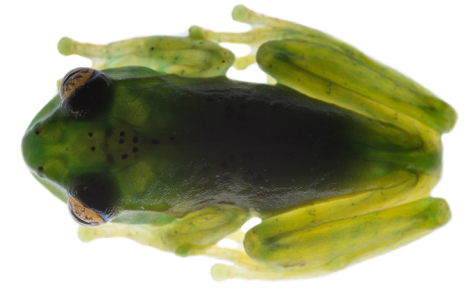


A guide to facilitating engagement in amphibian conservation through compelling images



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Introduction

Amphibians are the most threatened vertebrate taxa on the planet. The latest figures from the IUCN Red List of Threatened Species show that there are nearly as many threatened species of amphibians as birds and mammals combined, and that the proportion of threatened species is potentially greater than 40%. The data are clear, but many people are unaware of the problems faced by amphibians today. While many 'charismatic mega fauna' are chosen to serve as ambassadors for the message of conservation, we believe it is appropriate and necessary to tell the story of all species in need of protection – even the sessile, and the creepy, and the brown ones. This is important, not only because fluffiness does not equate to conservation value, but because we acknowledge the adage that humans will not protect what they do not love and cannot love what they do not know. If we only tell the story of the popular species, those which are less photogenic or hidden in the swamps and caves of the world are likely to be forgotten. In the race to halt species extinctions, we must understand and appreciate all species.

Fortunately, amphibians can be as charismatic as any large mammal. They live in nearly every corner of the planet and are fascinatingly adapted to their surroundings. We are compelled to share our passion and tell the stories of forgotten species by capturing the unique beauty and character of amphibians.

About this Ebook

Designed for researchers and conservationists working with amphibians, this ebook aims to provide an overview of techniques that can be used to create engaging images and demonstrate how these images can be utilized to tell the stories of amphibians and amphibian conservation.

The ebook does not delve too deep into the technicalities of each approach, but will hopefully stimulate further learning for those that wish to take their photography and communication skills to the next level.

Although the title and text make greater reference to frogs, most techniques can be applied interchangeably between frogs, toads, newts, salamanders and caecilians. Any bias towards frogs is purely due to the availability of frog images and approachability of the word 'frog'.

Finally, this ebook fulfils the following priorities of the Communications and Education Working Group of the 2015 Amphibian Conservation Action Plan:

- Section 1.2 ii. Continued identification of opportunities to communicate need & transfer skills for public engagement;
- Section 1.2 vi. Continue to use diversity of media for sharing knowledge within our community (e.g. amphibians.org website, social media (Facebook, Twitter, Instagram, etc.), video, photography, and publications).



About the ASA & ASG



The **Amphibian Specialist Group (ASG)** is part of the Species Survival Commission (SSC) of the International Union for Conservation of Nature (IUCN). It is a network of the world's leading amphibian experts providing scientific guidance to enable conservation actions to be prioritized and implemented by the Amphibian Survival Alliance (ASA) and the wider conservation community. Under the umbrella of the ASG, the Amphibian Red List Authority is the body responsible for overseeing the assessments of all amphibians on the IUCN Red List of Threatened Species.



The **Amphibian Survival Alliance (ASA)** is a global partnership of organizations and groups working to implement research and conservation actions for amphibians. ASA promotes and coordinates the implementation of conservation actions for amphibians through an active, growing, engaged, committed, and collaborative partnership around the world.

ASG and ASA, together with Amphibian Ark, share a common vision of *Amphibians thriving in nature*.



About the Author

Robin Hoskyns is a science communicator and photographer from the UK, who has a passion for amphibians and a love of tropical rainforests. He has a background in conservation and behavioural ecology and has worked on research and conservation projects in South Africa, Central America and Madagascar.

See more of Robin's work at www.robinhoskyns.co.uk

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↘ *Boophis luciae* from Madagascar. Photographed by placing the flash underneath the leaf in order to emphasise the translucent skin of this species.





1. Visual Storytelling

(Robin Moore)

Since we began drawing on the walls of caves, visual storytelling has played an important role in helping us to make sense of the world, and in determining where to direct our attention and energy. It is therefore an incredibly powerful tool for connecting people with your work.

Amphibians can make great stories as they can be portrayed as rare exotic jewels whilst at the same time are ubiquitous enough that many people can engage with them at a local level, helping them to connect. Whilst much of the focus is on photographic techniques, the primary purpose of this ebook is to provide the tools to illustrate these stories and it is important not to lose sight of this goal.

The rapid rise of tools to capture and share images poses both a challenge and an incredible opportunity for photographers to communicate through images and stories. It is easier now than ever before to get our images in front of thousands or tens of thousands of eyeballs, but there is also more noise.

So how do you cut through the daily noise to be heard?

Although the technologies we use to capture and share photographs are evolving, the methods for storytelling are ancient and consistent. Stories can be told through individual images paired with carefully crafted captions, as well as through series of images.

When trying to tell a story through a single photograph, think about how the elements in



↑ Adding people to an image can be one way of creating a story. This image tells the story of searching for nocturnal frogs and emphasises human connection with nature.

the image interact. Look for juxtapositions – for example, a photograph of a beautiful wild animal surrounded by a human-altered landscape can be powerful because it challenges preconceived ideas, and invites us to reflect on the impact of our actions on an individual.

Pair your photographs with captions that bring context and meaning that may not be apparent from the image by itself. Effectively pairing words with pictures enhances attention, memory, recall, and believability. If the message does not fit with the visual it can detract from the overall power of the photograph, so make sure the caption reinforces and builds upon the image.

Think about characters in your stories – both animal and human - that the

audience can connect with. Tell their story and bring them to life. Become a character in your own stories. To most people, what you are doing is fascinating. Bring them along with you on your adventures through your images.

Look for situations and experiences that move you, and tap into your own emotions to connect with the audience. Think beyond the bare facts – channel the wonder, awe or surprise you felt when you saw a specific animal, or sheer elation of overcoming challenges to get a particular shot, as these can form the foundation of a good story.

Use series of related images to tell stories. Before going into the field pre-visualize the shots you need to tell the story you have in mind, and try drawing them out as a storyboard. Don't close your mind to unexpected opportunities once in the field, however, as sometimes the best stories end up not being the ones you set out to tell.

Use a variety of techniques to tell the different elements of a story: use wide-angle, medium and close-up shots to show subjects in their environment, in action and to home in on interesting details. A story will often start with a wide shot that establishes a sense of place before homing in on different elements of the story, but don't be bound by rules; be creative, and use your instincts as a guide.

As good as your instincts may be, it is important to have objective feedback on your stories. Test them out on your friends and colleagues and solicit candid feedback as to what works and what doesn't. Friends and family are inclined to shower praise on our photos and, while this helps us to grow in confidence and is why we love them, constructive critique is important. Don a thick skin and ask for honest feedback.

Think about what you want people to do once they have been moved by your photos and enable them to take action should they feel inclined. How a story is framed is important. While dramatic scenes of environmental destruction or dead animals can grab attention, try to accompany these with solutions or research towards solutions to make people feel enabled to be a part of the solution.

Explore platforms for bringing your stories to a wider audience, such as the newly formed Maptia; longer running platforms Medium and Atavist; and, of course, Instagram and Facebook. Medium and Maptia work well for photo stories accompanied by a text narrative, Atavist allows you to easily embed video clips and maps, and Instagram and Facebook work well for singular images and short video clips. The new Instagram 'Stories' allows you to combine images and video into a slideshow format. Because it is forgiving and fast paced, Instagram lends itself to sharing “behind the scenes” photos and video,



while platforms like Maptia, Medium and Atavist work well for developing a longer form product and for telling a more involved story.

Don't be overwhelmed by all the options available. While it's good to be aware of the tools that are at your fingertips, and to think about the ways in which you can integrate different media to tell a story, don't let the choice of media dictate the story. The most important thing is to have a clear vision of how you want to tell your story in an authentic way, and bring in the media that will help you achieve your vision.

Lastly, in this interconnected world it is important to partner with people and groups that are doing work you support. Conservation groups can provide a platform for your photographs and stories to get them in front of an interested audience. Connect with ongoing initiatives or campaigns to leverage the reach and impact of your photographs and stories, or start your own campaign and invite others to join through social media. Think about how your photographs and stories can most contribute to the bigger picture of amphibian conservation, as this is what will truly give them lasting value.

← The translucency of the frog in this image, as a result of movement during a long exposure, helps to emphasise the story of species decline by using the visual metaphor of 'vanishing' frogs.

2. Amphibian Natural History

Amphibians have a truly diverse array of life history strategies which makes them particularly enthralling. Capturing this diversity photographically, and creating images that tell stories about these fascinating strategies, is what this ebook is all about.

Frogs and toads are the most recognisable of amphibians; however, the Class Amphibia also includes salamanders, newts, and the rarely seen caecilians.

There are currently over 7,500 recognized amphibian species alive today (and counting!), with representatives present in virtually all terrestrial and freshwater habitats, except for the coldest and driest regions and the most remote of oceanic islands.

The Class Amphibia is divided into three Orders: Anura, the frogs and toads; Caudata, the newts and salamanders; and Gymnophiona, the caecillians.

Anurans are the most widespread and species-rich of the three Orders, with well over 5,000 species. The highest species density of anurans occurs in tropical forests, but they also inhabit deserts and drier habitats, and can be found on every continent, except Antarctica.

Caudata comprises of roughly 500 species. These are much less widespread than the anurans as they are absent from Sub-Saharan Africa, Madagascar, the Indian subcontinent south of the Himalayas, insular Southeast Asia, and Australasia, with only a few species occurring in South America and mainland Southeast Asia. The hotspot for Caudata species occurs in the eastern United States.

Gymnophiona are the oldest of the three Orders, and are the least speciose, with only 172 described species. They are the least widespread, occurring mainly in tropical South America and parts of Asia and Africa. They are also the least well-studied due to their frequently fossorial nature, although some species are aquatic.

As their name indicates, many amphibians are amphibious – living both on land and water at different stages of their life cycles. These life cycles and life histories are extremely varied, including species that complete their entire life cycles in terrestrial habitats, species that are wholly aquatic, and many species that undergo direct development or bear live young rather than lay eggs.

Knowing the specific life history and ecology of the species you wish to photograph is particularly important for locating your subject in the first place, for informing the kinds of photographic equipment that you will need, and for informing the basis of the story you wish to tell through your images.



3. Which Camera?



Photography certainly is not all about gear, but good gear helps. Many owners of expensive cameras take less than average pictures. However, with skills and knowledge, a better camera gives much more flexibility for improving results. Having said that, the best camera is the one you have with you at the time so choosing the right camera is important. This guide is not intended to advocate for specific makes or models, but is more an overview of the types of camera available today.

DSLR Short for 'digital single-lens reflex' cameras. These are the choice of most professionals for a reason. The top DSLRs have the best image quality, most technology, and the best choice of lenses. They also can be highly customisable for different styles of shooting.

DSLRs range from entry-level to full professional models and although they vary in the amount of extras and technical specifications, the basic settings should be easily accessible and all will still have a wide selection of automatic settings.

Professional level DSLRs are extremely rugged and often weather sealed, when used alongside weather sealed lenses they are able to stand up to a lot of abuse.

The main downsides of DSLRs are that they can be big, heavy and expensive, especially if going for the higher end models. If you want the best quality for multiple types of subject then you will also end up taking several lenses with you.

Selecting a brand is down to personal preference, but it may be worth checking with friends, colleagues and expedition partners as being able to swap or share lenses in the field may offer up some extra opportunities.



Mirrorless Mirrorless cameras have rapidly improved over the last few years. These are any cameras with interchangeable lenses that lack the prism and mirror system that make DSLRs bulky. Because of this mirrorless cameras are much smaller and lighter and can be cheaper too.

Mirrorless image quality is on par with all but the best DSLRs and the choice of lenses is growing, along with adapters that allow you to use almost any DSLR lens available.

Many mirrorless cameras are aimed at a non-professional market. However, models in the top end of the range are increasingly being used by professionals.

Many have a similar control set-up to a DSLR, but sometimes menus on mirrorless cameras can be confusing, with basic settings less readily accessed, and a greater reliance on auto modes.

Extras such as flip-out screens etc. can make these cameras a little more vulnerable in the field so they may not stand up to as much abuse as a mid-range DSLR.

There is a lot of variation between these models, so it is definitely worth testing out and doing some research before making a purchase.



Compacts Although the image quality of compact cameras is rapidly improving, generally it will be below that of either a



mirrorless camera or a DSLR. What compact cameras lack in quality, they make up for in portability.

With compacts, the lenses are built-in and are not interchangeable; limiting you to what the camera comes with. Many do not give full manual control of the settings, limiting you to automatic modes. That said, recent advances in higher-end pocket cameras do offer manual control as well as more advanced optical properties.

Being pocket-sized, compacts can be very useful for record/ID shots and can give good results if used creatively.

Many compacts can also be waterproof, so can be used in environments that are just too risky for a DSLR or mirrorless camera.

GoPros GoPros and other action cameras are almost always more useful for video than still images. They usually give almost no control over camera settings for photos, although in

the right circumstances good images can be obtained.

GoPros come with a fully waterproof housing and are therefore very useful in wet environments. However, a fish-eye lens and limited close focus ability means they struggle with smaller subjects.

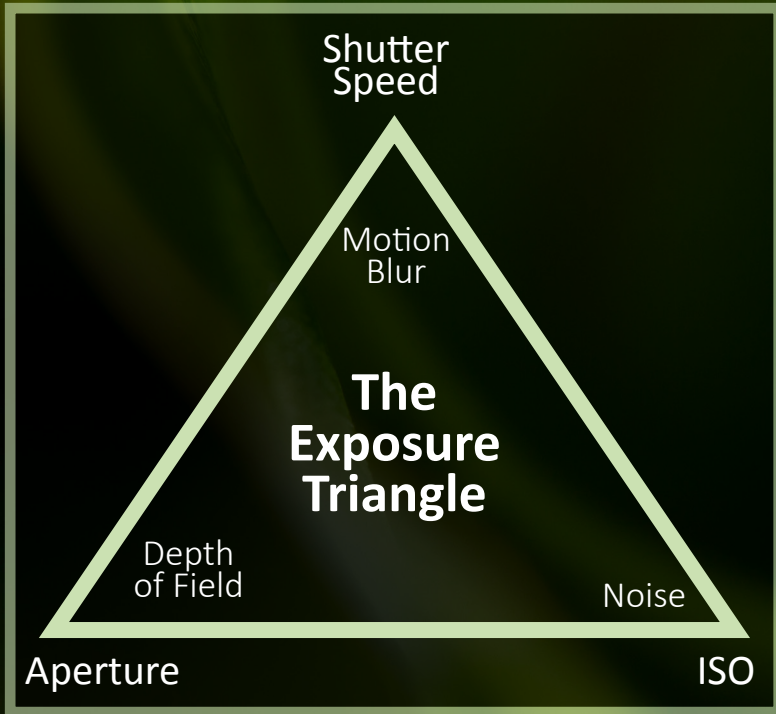
GoPros are probably more useful for videos telling the wider story of amphibian conservation work rather than for photographing amphibians themselves.



Whichever camera you choose it has to be right for you so make sure you identify your needs, and what feels most comfortable for you.

4. Basic Settings

Whichever camera you have and whatever you are photographing the principles governing exposure are the same. Only three things affect exposure: **Shutter speed, ISO and aperture**. The interplay between these three settings and the available light determines how bright or dark the image is. This relationship is often referred to as the exposure triangle.



Shutter Speed

Probably the easiest of the three settings to understand, this determines the length of time the shutter is open. A longer time lets in more light and a shorter time lets in less light. Darker situations will require a longer shutter speed, but the longer the shutter is open, the greater the risk of motion blur. Longer exposures can be used creatively to add intentional motion blur e.g. blurry water.

ISO This refers to the sensitivity of the sensor; the lower the light level, the higher the required ISO. It is important to bear in mind that higher ISOs reduce image quality by introducing excess noise resulting in grainy looking images. As a general rule, ISO should be kept as low as possible to

maintain a sharp image. Better high ISO performance can often be a key distinguishing factor between camera models. Higher ISOs are used for low light situations however when flash is used as the main light source the ISO can be dropped back to daylight levels.

Aperture This is the size of the hole in the lens through which light passes. Changing the aperture has slightly more complex effects than either shutter speed or ISO due to the creative impact on the final image. A wider aperture (smaller number e.g.

Photography literally means 'light-imaging'. It's all about capturing light.

Exposure is the measure of how much light is recorded, and as such it is crucial to understand the basics.

f/2.8) lets in more light, whilst a smaller aperture (bigger number e.g. f/11) lets in less light. The f-numbers are part of a ratio with the focal length of the lens hence why larger apertures are smaller f-numbers.

Changing the aperture also affects how much of the image is in focus (called 'depth of field'). Small apertures will allow a greater range of focus within the scene, whereas wider (larger) apertures will give a soft blurred background and help to isolate the subject.



Controlling the Exposure

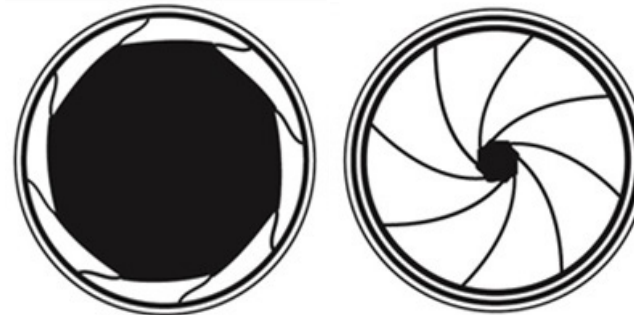
DSLRs (and most mirrorless cameras) usually allow full control over the settings by using 'manual' mode. In manual mode each parameter will have to be set individually.

In some situations the total control offered by full-manual mode is useful, but it can be slow to adapt to changing light for the less experienced photographer and the learning curve can be steeper when dealing with all three parameters at once. Manual mode is usually also preferred when using flash as the main light source.

Most cameras offer 'semi-auto' modes where one of the three parameters is adjusted automatically. When using semi-auto modes it is best to determine the most important creative parameter and choose the setting that gives manual control (priority) over that one.

Aperture priority tends to be used most often as the effect on the final image is more useful in most situations. When using aperture priority the aperture is defined by the user and the shutter speed is automatically changed to maintain the correct exposure. If the shutter speed falls too low and images are subject to motion blur then the ISO can be increased by the photographer.

The technical skill in exposing correctly comes from balancing the effects of each element in the exposure triangle. With enough practice it will become second nature.



Large Aperture
E.g. f/2.8

Small Aperture
E.g. f/11

↑ The diagram above shows the difference between a 'wide open' (large) and a 'stopped down' (small) aperture.

↓ The table below shows commonly used full stop increments. Individually changing any of the three parameters by one stop will have an identical effect on exposure.

Effect on Exposure	Shutter Speed	ISO	Aperture
Darker	1/250	ISO-100	f/11
-	1/125	ISO-200	f/8
-	1/60	ISO-400	f/5.6
-	1/30	ISO-800	f/4
Lighter	1/15	ISO-1600	f/2.8

Photographic Stops

Exposure is measured in 'stops'. A single 'stop' is a doubling or halving of the amount of light recorded when taking a photo. Decreasing the size of the aperture is usually referred to as 'stopping down'.

Stops are a way of standardising the cameras settings so that by increasing one exposure parameter by a full stop you can then decrease another by the same amount and have no overall effect on exposure. Most cameras allow parameters to be set at 1/3 stop increments for finer control.

Metering

When using full auto or semi-auto modes it is important to understand a little about how the camera measures light. The cameras 'meter' calculates settings to balance the exposure to an average value across the frame. When things are evenly lit it usually results in a good representation of the scene.

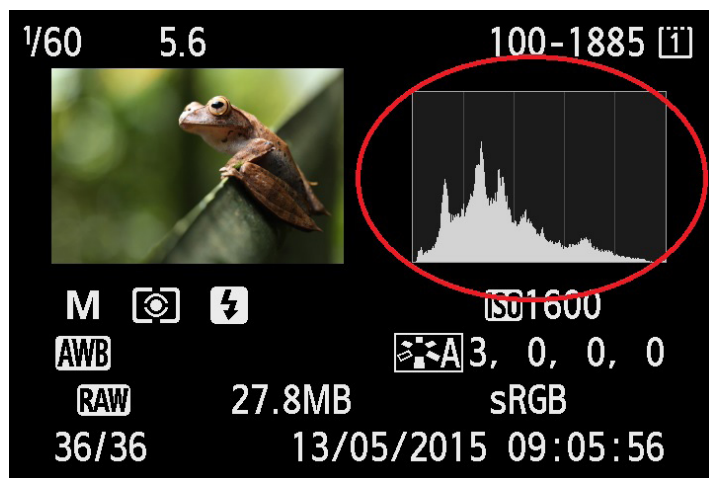
When there are large differences between light and dark areas or the scene is skewed towards either bright or dark then the meter tends to over-compensate. For example when shooting in snow a good proportion of the image is brighter than average so the camera over-compensates often making snow appear grey.

The range of light a camera can record is less than the eye can see. This makes high contrast scenes especially difficult.

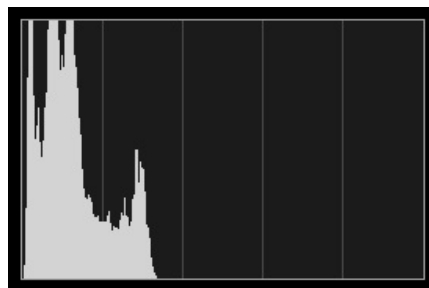
Areas with strongly contrasting light, such as forests with sun shining through, are problematic and can result in images with no detail in the shadows and overexposed highlights.

In these situations you need to override the camera's meter with a technique called 'exposure compensation'. This will allow you to bias the camera's meter, making the image brighter, or darker, depending on the scene. Whether you choose to make the image brighter or darker depends on if you think the key subject is in the highlights or the shadows. Again practice and experience are the key to getting this technique right!

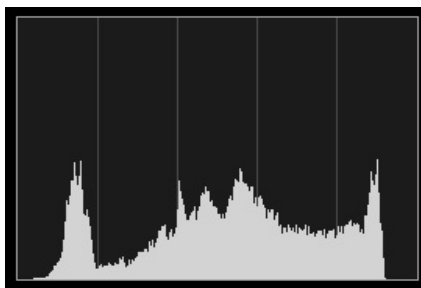
↓ A screenshot from the back of the camera showing the histogram function circled in red.



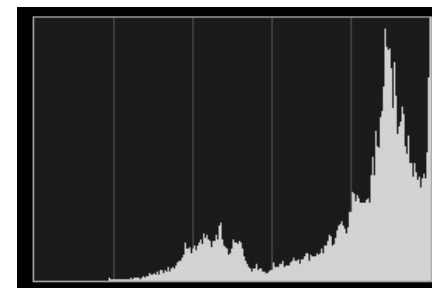
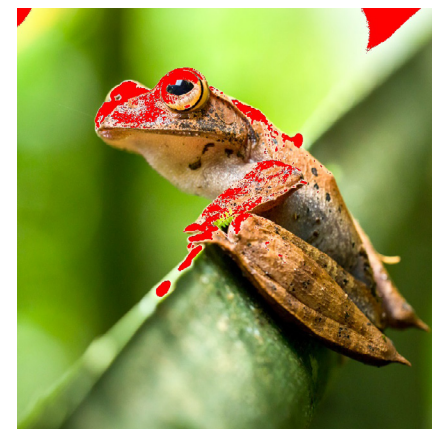
Underexposed
(Blue showing clipped blacks)



Properly Exposed
(No Clipping)



Overexposed
(Red showing clipped whites)



Using the Histogram

Getting the exposure you want, in camera, at the time of shooting will consistently make your images better than relying on the use of software to fix exposure later. A reliable method for checking exposure when viewing images on the camera screen is the histogram function, which provides a graphic representation of how many pixels are associated each brightness value. A balanced histogram with a bell shaped curve will generally signal a nice even exposure. If a good proportion of the image is dark it will be skewed to the left and a bright image will be skewed to the right. There is no such thing as 'perfect exposure' as this can depend on exactly how you want the final image to look and your creative intention, for example 'high key' images where the frame is mostly light with a dark subject and 'low key' images which are mostly dark with a light subject.

Clipping

The histogram shows the range of data captured by the camera from pure white to pure black. If the exposure is badly under or over exposed then you will experience 'clipping'.

Clipping occurs when the possible data in the scene exceeds the range that the camera is able to capture, resulting in the highlights and shadows being rendered as solid black or white, therefore not containing any visual detail.

Some scenes will contain more contrast than the camera is able to capture and therefore some clipping is inevitable. In these situations it is best to decide if the most important detail of the image is contained in the shadows or the highlights and then expose accordingly using exposure compensation.



↑ A longer shutter speed can give motion effects such as this 'blurred water' in this rainforest stream image although a tripod is required to keep non-moving aspects of the image sharp.

Image Quality: RAW or JPEG

One of the most important settings on the camera is the image quality setting. To get the best quality you should set your camera to use RAW. RAW is a file format that stores much more data than JPEG (RAW is up to 16bit and JPEG is only 8bit). As these files cannot be used without processing first, the best way to think about them is as 'digital negatives'.

Low and mid-range compact cameras will only be capable of shooting in JPEG, but higher-end compacts, all DSLRs and most other cameras now have the option to shoot in RAW.

RAW gives you much more information in both the highlights and shadows and greater control over the white balance. This gives much more leeway than a JPEG when it comes to editing.

Using RAW can have drawbacks: this format cannot be directly read by most computers without additional software and files must be edited and converted using this software before using them. RAW files can be annoying if quick access is needed or you need to send images with slow internet speeds.

As RAW files contain so much more information their file sizes are many times larger and therefore require larger (or a greater number of) memory cards and more storage space for backing up.

If storage space is not an issue, most cameras can be set to shoot both RAW and JPEG simultaneously. This gives the best of both worlds, with quick access to images in the field and the RAW file to process when you return home.

5. Composition

Whilst the technical aspects of photography can bog many people down, being technically masterful does not necessarily result in engaging images.

The real key to good image making is composition. People who are naturally creative intuitively master this, while others spend years developing the 'photographer's eye'. There are, however, some simple techniques and 'rules' in composition that can be easily learned and will hold true in the majority of cases, drastically improving the story-telling ability of your images.

What is included in the frame and more importantly, what is not is the most crucial element of photography. Thinking about what you want the image to say and what impact you want it to have should guide the process.

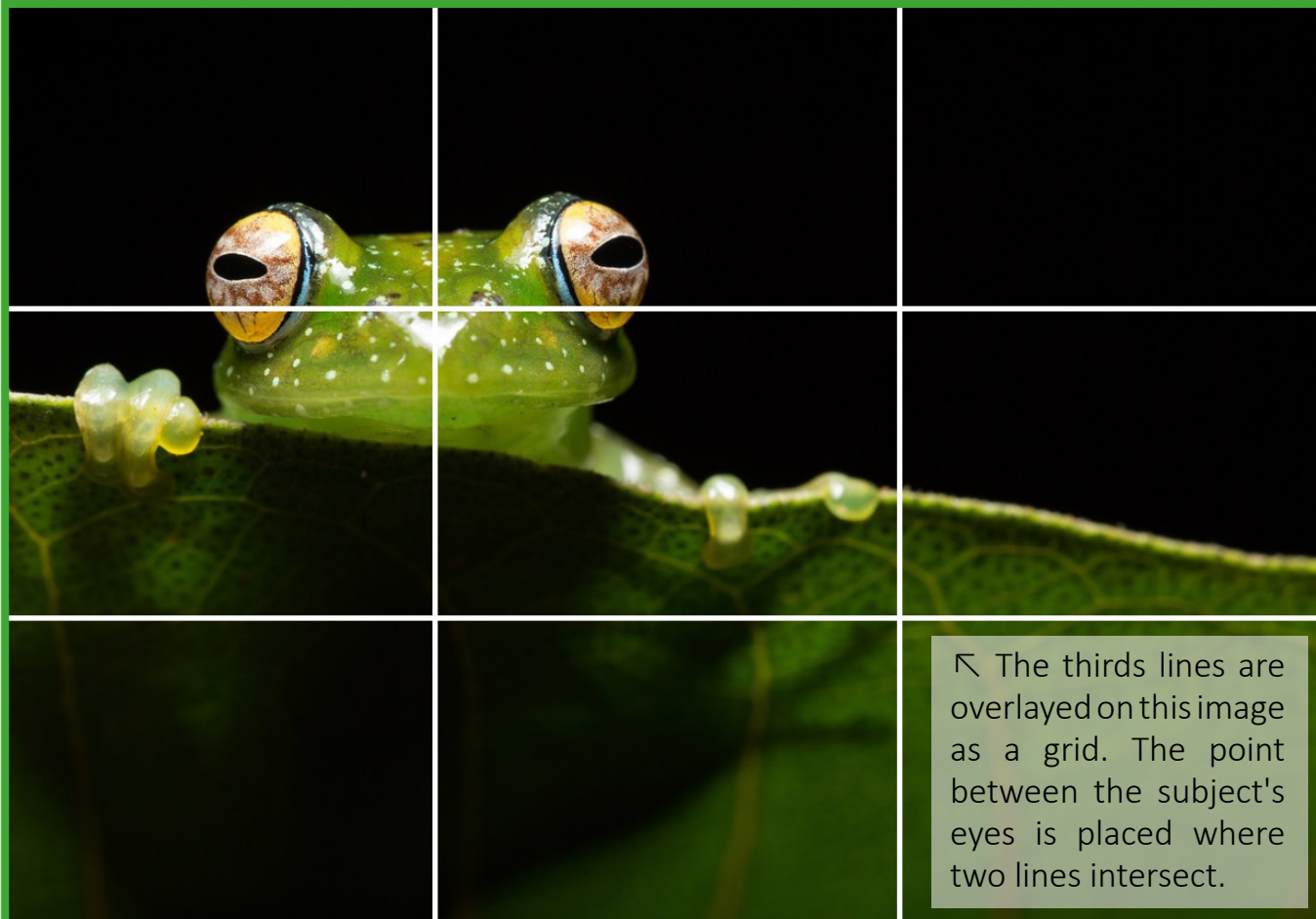
There is no true right or wrong with composition because photography – like beauty – is subjective. The key really is having a conscious thought process, considering how the image draws the eye and how it can emphasise the subject.

When looking at images that grab your attention, practice analysing what makes them interesting. This will help you create stronger compositions in your own photography. Over time this analytical processing will help you to build a mental library of compositional techniques, ready to be applied when the right situation presents itself. You may even find yourself framing images in your mind, even when you do not have a camera. That is when you know you have a 'Photographer's Eye'.



The Rule of Thirds

The 'Rule of Thirds' is the most widely used compositional technique in photography. It can be visualised by dividing the frame up into three, both horizontally and vertically, with the lines forming a grid. Placing the subject on one of the lines will generally result in a powerful composition. Whilst termed a 'rule' it should be seen more as a compositional technique to be used as-and-when the subject matter suits.



↖ The thirds lines are overlaid on this image as a grid. The point between the subject's eyes is placed where two lines intersect.

Developing the "photographers eye"

An effective image starts with good composition. Good composition holds the eye of the viewer for longer regardless of the subject. Consciously taking notice of how your eye travels around an image can improve how you critically view images and will allow you to analyse compositional technique in images taken by others. Ideally the eye will be drawn to the main subject but also be allowed to travel and take in the rest of the image before falling back on the subject.

- Images with a central subject tend to feel much less 'dynamic' to look at. Moving the subject to one side creates more visual 'tension'.
- The strongest position for a focal point to be placed is where any of the thirds lines bisect; with animals the focal point is usually between the eyes.
- On most camera screens a thirds grid can be set as an overlay to help improve composition when setting up the shot.
- Images containing strong vertical or horizontal lines work very well when these are placed along a thirds line.
- The Rule of Thirds works in most situations and is many photographers' go-to composition unless another stronger composition immediately presents itself.
- Despite the strength of the Rule of Thirds, a central composition can occasionally be effective, especially when used to convey symmetry and balance, or with extreme close ups.

Clear Subject

Unless your intention is to create an abstract shot, the intended subject of your image should be immediately obvious. Using a shallow depth of field and an uncluttered background can help highlight the subject, as well as using graphic elements, such as lines or shapes, to draw the eye to the subject.

Eye Level

Another way to increase the impact of wildlife images is to photograph at the subject's eye level. This can involve getting down and dirty with ground-dwelling frogs and salamanders, but can be easier with

tree frogs. Eye level shots give a feeling of engagement with the animal rather than peering down from above. It can also serve to increase the distance between subject and background, and gives more opportunity to include foreground objects.

Foreground/Background

Images that include just the subject against a smooth background can be effective; however, including a foreground can help add a lot of depth to an image. Placing your subject in the middle ground is usually the most effective.

Lines and Graphic Elements

Lines are powerful graphic devices to include in an image. Lines can serve to direct the eye to the subject, offering a connection between the foreground and background. 'Implied' lines such as a subject's eye line, direction of movement, or lines between key elements in more complex compositions, can have a great impact.

Building interesting shapes, textures and forms into images is one way to create more advanced compositions, as is including multiple elements. When doing this, consider how all elements interact; for example, three elements can be more dynamic than two.

↘ In this image, the bright water lily in the foreground helps to push the viewer's eye towards the Common Frog behind.



Negative Space

Negative space is any area in the image that does not contain the subject or any fine detail. Utilising this space can be as important to the composition as the subject itself. Keeping your subject 'small-in-the-frame' can be just as powerful as filling the entire frame with your subject, if not more so. Negative space has a visual 'weight' helping to push the viewer's eye to the subject, conveying the mood of the surroundings, and implying that the subject could conceivably move about within the frame.

- Wider images can add variety to a portfolio and can be used to convey the relative size of a small subject in its environment.
- Large areas of negative space work especially well with either a shallow depth of field or an uncluttered, smooth background.
- As with the Rule of Thirds, it is usually better to have your subject looking into the space, as the eye-line of the subject can lead the viewer's eye into the rest of the frame.

One major bonus of composing images with large areas of negative space is that they are extremely flexible when used editorially, as text can be added over the image without covering the subject. If possible, it is worth taking many similar images, varying the placement of the subject in the frame to give as many options as possible if you ever need to lay out a page.



6. Post Processing

Getting it right in the field will save you a lot of time when selecting and editing images back home.

Editing should not be seen as a backup for poor technique. However, it does have the power to lift an image and add a bit more punch. Although editing can be time-consuming and tedious, the power of subtle adjustments should not be overlooked.

The level of editing regarded as acceptable has been a hotly debated topic since the beginning of digital photography. The truth is that even before digital, film images were edited in darkrooms and all digital images are invariably processed to some extent within the camera itself. Taking control of this process by shooting RAW and applying minor adjustments on the computer has the potential to drastically improve your images.

Image Selection

The first stage of editing, and probably the most important, is choosing which of your images are good enough. What makes the best image is purely subjective, but holding in mind a theme or intention for a particular set of images can allow you to assess them more quickly.

Some photographers recommend leaving images for a while before sorting through them. This can help reduce emotional attachment to those 'almost' images. Other people require the excitement of a fresh batch of images to get through the initial stage of editing. Do whatever works for you, but when considering social media engagement it may be best to keep them current to promote particular events. Being able to quickly choose a small number of images from several hundred or thousand is

an invaluable skill.

The real key with image selection is to only show your best work. Showing hundreds of similar images is likely to cause the viewer to become disinterested and any images that are not up to scratch have the potential to drag surrounding images down.

Software

One of the huge benefits of shooting RAW is that editing does not overwrite the original



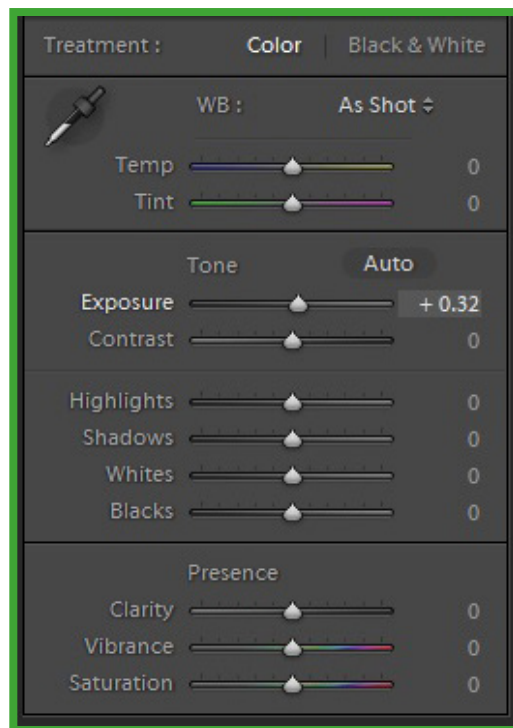
↑ A screenshot of Adobe Lightroom editing software.

file, as happens with a JPEG. Rather, the changes are saved as a separate file and only applied when exporting the finished image. This means that you never risk saving over the original file and subsequent edits will not compound and reduce image quality.

Plenty of free RAW processing software is available. Generally, camera manufacturers provide proprietary software along with the camera and relatively cheap or free editing programs can be found online.

For more advanced users, Adobe Lightroom is the industry standard. It combines an incredibly powerful RAW editor with cataloguing and image management functions. It can have a steep learning curve but it has many tools and presets to facilitate a smooth workflow.

Adobe Photoshop has much more powerful image manipulation tools, however it cannot recognise RAW formats. Some photographers use Photoshop for final corrections and advanced editing, but most photographers do not need the majority of functions that Photoshop provides and prefer to stay within their chosen RAW processing software. If budget is an important consideration, a good, free and open-source alternative image editor is GIMP, which offers many of the same functions as Photoshop.



Monitor Calibration

For professional levels of colour consistency, especially when printing images, it is recommended to use a high quality monitor and to regularly calibrate it using a plug-in external calibration tool. For many non-professional photographers, it may not be worth the time and expense of buying a calibrator, so it is worth checking images on as many different computer screens as possible to check if your screen has a consistent colour bias. It is generally a good idea

←The basic editing panel in Adobe Lightroom, showing the 'sliders' used for adjusting different parameters.

to turn down your monitor brightness slightly as a monitor that is too bright will result in very dark images when sending to the printers.

Basic Editing

This workflow is based around Adobe Lightroom however most processing software will have similar parameters to adjust.

The key to achieving natural looking images is not to push any particular parameter too far. Many small adjustments can make a big difference overall. If you have spent the time to get well-exposed and well-focused images in-camera, you should only have to make minor tweaks.

1. Exposure

The most effective parameters to give a boost to an image during editing are brightness and contrast. If your image is either under or over-exposed, the brightness slider can be used to correct the exposure. Drastically increasing the exposure on an under-exposed image will result in a lot of additional noise, resulting in a grainy image. If the highlights are 'blown' or 'clipped', reducing the exposure will not bring back any detail in these areas.

2. Blacks/Whites/Shadows/Highlights

After correcting exposure the next step is to set the

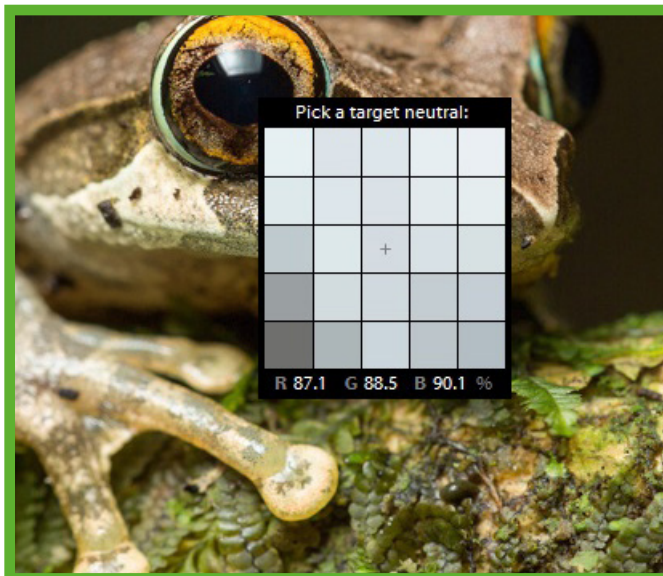
blacks and the whites using the sliders. This allows you to make sure anything that should be white, is white and anything that should be black, is black.

An 'ideal' exposure should have both a tiny amount of pure black and a tiny amount of pure white with all other values somewhere inbetween. This does not necessarily apply to all images so some judgement is required. Some software will give a very useful overlay that will highlight areas of pure white and pure black.

Adjusting the blacks and whites should achieve a good level of contrast; however, be careful not to push it too far. If areas are still too dark or too bright but not black or white then the shadows and highlights sliders can be used to bring out detail in these areas.

3. White Balance

If you are shooting in RAW format then you should have very good control over the white balance settings. As with all edits, these can be judged by eye using the sliders. White balance can also be selected with the eyedropper tool. The eyedropper will only be of use if there is an area of the image that is neutral in colour (look for an area in which the red, green and blue channels are all equal). By selecting this area an accurate white balance should be achieved. This can always be fine-tuned if things do not look quite right.



↑ Using the white balance 'eyedropper' tool to find a neutral area (equal RGB values).

↓ Using the brush tool to add local adjustments.



4. Local Adjustments

All but the most basic editing software should enable you to apply adjustments to specific areas of the image. This is especially useful for lightening and darkening certain areas, known in darkroom terminology as 'dodging and burning'. Subtle dodging and burning can very effectively draw focus to the subject by darkening distracting objects in the background or foreground.

Local adjustments of contrast and clarity can give an increased appearance of focus on the subject.

When one side of an image is much brighter than another, for example when both the sky and land are included, a gradient filter can be used to give a smooth transition from bright to dark.

5. Sharpening

Sharpening is usually applied to the entire image upon export of the final image; this should vary depending on the use of the output. Sharpening results in increased noise, especially in areas with little fine detail, therefore any additional sharpening is best applied locally to an area of detail.

7. Macro

Amphibians can be quite small relative to other vertebrates, which can make them tricky to photograph. Most lenses for DSLRs are not designed to cope with small subjects, so for the smallest, it is impossible to achieve adequate magnification with a standard lens.

What is a “Macro” Lens?

A ‘true’ macro lens is defined as one that can achieve a 1:1 magnification. This is when the subject in front of the lens is projected at exactly the same size onto the camera sensor, giving a ratio of 1:1. With a full-frame (35mm sensor) camera this means that a 35mm frog would fill the frame.

Entry-level DSLRs generally have smaller sensors, providing a 1.6x crop factor, which gives the impression of increased magnification. The extra magnification of macro lenses is possible because they are designed to focus at much closer distances than non-macro lenses. Dealing with this proximity presents a unique set of problems, such as reduced depth of field, minute focusing tolerances and approaching your subject.

Alternatives

Macro lenses for DSLRs and mirrorless cameras can be quite expensive and although

true macro lenses are by far the easiest option for amphibian photography, there are alternatives.

Compact cameras can achieve a reasonable magnification due to their much reduced sensor size and large depth of field. Many have dedicated macro modes, but these rarely have the ability to shoot at full 1:1 magnification, and the usefulness of these modes is highly variable between camera manufacturers and different models.

‘Extension tubes’ can be purchased which fit between the lens and the camera, allowing non-macro lenses to focus closer than usual. Some extension tubes do not have electrical contacts between the lens and camera body and can be very challenging to use. Extension tubes can also be combined with a true macro lens to give even greater magnification.

‘Diopters’ or ‘close-up filters’ are also available. These screw or snap on to the end of a standard lens although you need to make sure you buy the correct size to fit. These can provide differing levels of magnification depending on the strength of the filter and the focal length of the lens used as magnification increases

with longer focal lengths. Close up filters can seem like one of the cheapest options for beginning to experiment with macro photography however they vary massively in quality, with cheap filters severely reducing image quality and even good ones producing some edge distortion. It pays to research the specific filter you want to buy and check any issues before purchasing.

Depth of Field

The single biggest hurdle to overcome with macro photography is the miniscule depth of field. As the focus point moves closer to the lens the depth of field decreases. With macro lenses at 1:1 magnification the depth of field can easily be less than 1mm, making accurate



focusing very challenging. Even if focusing is accurate, a good proportion of the subject may still be out of focus unless it is very small.

Smaller apertures (e.g f/11) increase depth of field. The downside is they also reduce the amount of light to the camera's sensor, meaning that a tripod or flash has to be used unless the light is very bright.

Larger subjects and good light make hand-holding a macro lens easier, although even then a steady hand is required. At greater magnifications even the tiniest shake can result in motion blur.

Focusing

Auto-focus is not always very useful with macro photography, even with the best camera and lens combination. Often by the time the camera has locked on, the plane of focus has shifted slightly

due to hand shake. For more consistent results, it is best to use manual focus, set the desired magnification, and then move the camera until the plane of focus falls in the correct position.

When shooting without a tripod the best technique is to set the magnification and then focus by rocking backwards and forwards and firing the shutter when the desired focus is achieved. This can take a lot of practice and patience. Often it is better to try to get several images in one 'pass' going from the plane of focus in front of the subject to behind in as small intervals as possible, before checking to see if any have good focus. Several little techniques can assist with this method. Try resting against something steady, or using a stick or beanbag for support and setting the camera to continuous or "rapid-fire" mode, this can help reduce shake that results from pushing the shutter button.

With a tripod, focusing is made much easier with a set of focusing rails, some of which can move in multiple planes making composition less fiddly as well. The problem with tripods, though, is that they can be slow and clumsy making it a challenge to photograph moving creatures.

← Focusing with macro can be a challenge, especially when only using one hand to steady the camera.



This difficulty in achieving focus means shooting with a macro lens or mode can result in a low 'hit-rate' of suitably focused images. Practice is the key to successful macro photography, so keep taking images until you get your shot. Checking for focus on the camera's LCD screen while shooting can help to avoid disappointment!

Working Distance

This is the distance between the subject and the camera necessary to achieve 1:1 focus. Lenses with longer focal lengths give

larger working distances (e.g. 100-200mm), whereas shorter, wider lenses (50-60mm) give much less. With some lenses the working distance can be just a couple of centimetres, meaning you will have to be very close to your subject.

Field Skills

Macro is all about getting close. With wild animals this can be tricky. Some frogs can be very willing subjects and will sit nicely; however, others, such as poison dart frogs, can be incredibly jumpy and frustrating!

Using a lens with longer focal lengths can help with the jumpier species and are also very helpful for flighty insects such as dragonflies. Good field skills and natural history knowledge are key to getting really close. For example, some species may be more approachable at certain times of day or during certain behaviours. Generally, moving very slowly and smoothly helps with approaching wary subjects. Often handling subjects before photographing can result in them being more agitated, or displaying a much less natural pose.



8. Flash Techniques

Built-in Flash

Most cameras come with a flash built in. These flashes can be useful but aren't very powerful and usually don't offer much control of the output. Another issue is that when shooting at close range, with built in flashes, there is a very high chance that the lens will block the light of the flash causing 'lens shadow'.

Ring Flash

One of the simplest methods for achieving even lighting is the ring flash. As its name suggests this is a flash where the bulb forms a ring with the lens protruding through the centre. The intention is that the subject will be lit from all directions, reducing harsh shadows. Although ring flashes are simple to use as they only need attaching to the front of the lens, they do have some drawbacks. Firstly they are designed for macro and therefore work best with subjects close to the lens. At longer distances the quality of the light becomes less and less distinguishable from a standard flash. This can mean that flexibility for shooting larger

Any dedicated amphibian photographer will eventually run into problems with the lack of natural light. The solution is to use artificial light, such as flash.

The majority of amphibian species are nocturnal and the places with the highest diversity of species tend to be dark environments, such as tropical rainforests.

Flash can be tricky to master. The main problem is that the light produced can be very harsh, with strong shadows and bright highlights. This problem is exacerbated with often shiny frog skin and wet leaves, which can give bright and often distracting highlights. There are several options for producing well-lit images with flash, each with its own pros and cons.

subjects and other creative options is they produce unnatural ring shaped reflections, limited. Secondly, ring flashes are generally called 'catchlights', especially in eyes which can less powerful than a standard flash. Thirdly, look unnatural and distracting.



↑ The ring shaped 'catchlights' produced by a Ring Flash reflected in the eyes of a Red-eyed Tree Frog (*Agalychnis callidryas*).

Macro 'Twin Flash'

Similar to the ring flash in that it mounts on the front of the camera, the twin flash has two flash heads which can be positioned and power controlled independently. By using one head as the main light and one to fill in shadows it can give much more natural looking light and can be much more flexible. Twin flashes are still very much macro focussed and limited for other uses. They are also very expensive.



← Light produced from a camera mounted flashgun with no diffusion.

Standard Flashgun

This is the next step up from the flash built into the camera, these are external flash units that slot onto the 'hotshoe' on top of the camera. Not specifically designed for macro they can be used for any type of photography. Combined with a wireless transmitter they are the most flexible option as multiple units can be used. When properly diffused they are capable of producing very good light. They can also be cheaper than some of the more specialised flash options.

Diffusion

The harshness of lighting is related to the size of the light source. As a small light source, flashes produce very harsh light. Increasing the area of the light source relative to the subject 'softens' the light. A demonstration of this effect occurs on cloudy days. Direct sunlight produces harsh shadows because the sun only fills a very small area of the sky however on a cloudy day the clouds diffuse the sun so the entire sky becomes the light source. Larger light sources work because light is hitting the subject from multiple directions, resulting in either muted shadows or no shadows at all. Diffusion is the key to achieving even light with flash.

The easiest way to diffuse a flash is to buy a 'softbox' these are pop-up boxes that fit on the front of the flash. The front panel is made of a semi-opaque material that works to spread out the light. Many macro photographers build their own softboxes depending upon their needs. These vary from a semi-opaque film canister for a pop up flash to complex multi layered concave diffusers for the macro twin flash.



← Light produced from a camera mounted flashgun, diffused with a softbox. Note the softer shadows and reduced highlights.



Off-camera flash

A diffused flash, mounted on the camera will give even lighting and reduce lens shadow for all but the smallest subjects. Frontal lighting can, however, seem a little flat. The next step to add more drama and depth to an image is to get the flash off the camera. This can be done either with a cable or with wireless triggers.

Getting the flash off-camera allows much more creativity with the direction of the light. Lighting your subject from left, right, above or even behind can give dramatically different looks to the same composition. It can also help to avoid foreground objects taking the full force of the flash by 'spotlighting' the subject.

← Light produced from a diffused flashgun off camera to the right.

Multiple Flashes

Two or more flashes can be used simultaneously with some models of wireless trigger. A main light can be used to illuminate the subject whilst secondary lights can be used with reduced output to fill in shadows or even illuminate a dark background. Multiple flash set ups can obviously be quite complicated so best to get fully confident with single flash techniques first.

TTL Metering

Flashes can be used on 'auto' mode. This works by firing a standardised pre-flash a split-second before the full flash. The light returned from the pre-flash is measured through the lens (hence the name TTL, which stands for Through The Lens) and adjusts the output of the flash burst used for the exposure.

Objects closer to the camera will return more light than objects further away. This can disrupt the metering of the flash output. Flash output can be adjusted by trial and error using flash compensation to force the flash to over or under expose. There is often a certain amount of trial and error with flash photography however time and experience will quicken the process.

↓ A black background is used effectively here to emphasise the graphic shape formed by the head of this Eyelash Frog (*Ceratobatrachus guentheri*).



Black Backgrounds

With nocturnal species a black background can be biologically appropriate although it doesn't always produce the most interesting images. Trying to add a bit of detail to convey a subject's habitat can be much more appealing. There are several methods for reducing the black background effect.

One of the key concepts to understand is the relationship between flash power and distance. This relationship is governed by the 'inverse square law' - if you double the distance between subject and light source,

it illuminates a surface area four times greater than the one before, hence light 'fall-off' quickly increases with distance. In order to achieve correct exposure on a subject close to the camera the flash power will be reduced, meaning that often the light won't be strong enough to reach the background, leaving it black.

At night, or when there is little or no natural light, black backgrounds can be overcome by reducing the distance between the subject and its background, either by choosing a subject or particular angle where the background is closer, or by manipulating the subject and/or the background itself.

Balancing Light Sources

If shooting in the day, a combination of flash and natural light can be used. Balancing the flash and natural light exposures can take a bit of trial and error but it can be really effective. Set the camera settings (ISO/aperture/shutter speed) to expose for the background and use flash compensation to expose for the subject. This technique may need a tripod when the natural light is low. By increasing the flash exposure relative to the background exposure, you can control how much the subject "pops" from the background giving a lot of control over how you want the image to appear.



↑ In this image the ambient light provided a dappled background and a diffused flash was used to 'fill in' for the subject which was in the shade.

9. Meet Your Neighbours

(Clay Bolt)

Meet Your
Neighbours 

The Meet Your Neighbours (MYN) field-studio technique for nature photography was pioneered by wildlife photographers Niall Benvie and Clay Bolt with the aim of illustrating 'backyard biodiversity'. The project is a worldwide photographic initiative dedicated to reconnecting people with the wildlife on their own doorsteps and enriching their lives in the process, through a better appreciation of biodiversity.

MYN images have an instantly recognizable look. A brilliantly-lit white background removes all distracting background or context. By removing the subject completely from its environment the focus is aimed completely at the form of the subject being photographed, encouraging appreciation of the isolated subject as a living individual rather than as a species.

This technique involves setting up a mini-studio in the field, lit with multiple flashes and a sheet of white plastic to create the pure white background. Adhering to the MYN protocol helps to reduce the photographer's individual style from the image,

thereby effectively levelling the playing field for all those who choose to join the MYN movement.

For some amphibian-focused MYN inspiration see ["The Amphibians" ebook](#) produced in partnership with the ASA and MYN.

The technique is designed to produce maximum subject detail with a minimum of shadows where the subject is set against a brilliant white background. When the flashes are set correctly, each background channel has no detail (R 255, G 255, B 255). From a designer's perspective, this is very useful; pictures can be dropped straight on to a white page and text laid out around them without having to make any additional selection. Moreover, the task of creating composite images of several species or individuals is made much easier when the elements are already, effectively, cut out.

When viewed this way, animals and

plants we thought we knew reveal another side of themselves, encouraging a second glance, and perhaps even a renewed interest. Likewise, species that are generally overlooked by the public, because they are small, cryptic, nocturnal, or inconspicuous are revealed as stunningly beautiful and intriguing when photographed using the MYN method.

The MYN initiative encourages photographers from around the world to produce images from their local community or field of interest, and share them online, through exhibitions, and via other forms of outreach. Partnerships with local museums, nature centres, and conservation NGOs outreach efforts ensure that images are widely seen, usually on a non-profit basis.

The Protocol

All the MYN photographers shoot to the same protocol as we want a uniform



“look” to the pictures: the subjects are the stars in this project, rather than any particular photographer, so we level the technical playing field for everyone.

The protocol requires that:

- All the images are shot in the field, on location and no subject is collected to photograph indoors – unless it’s there in the first place!
- The background of each image MUST BE uniformly 255 (without detail) in each channel and backlit. This gives the characteristic brilliance and translucence seen in MYN photos and facilitates design and compositing. Photoshop cut outs can’t match this look, especially in respect of how out of focus edges are rendered.
- Front lighting must be diffused and near shadowless to render maximum detail.
- Any subjects that require handling must follow strict hygiene protocols (especially with amphibians) with regard to transmission of infectious diseases and be returned as soon as possible to the spot from which they were collected. Photographers are expected to observe the normal ethical standards of their discipline.

Field Studio for Amphibians

Basic Equipment:

- Standard collecting equipment including sealable bags, transparent plastic containers, and suitable disinfectant for any surfaces where amphibians may come into contact.
- Digital camera with close-focusing zoom or

macro lens and manual exposure capability.

- Two or three flash units with diffusers. Synchronization cables, radio controllers or flash detectors to synchronize flashes.
- A table or light-box containing a horizontal sheet of at least 20 x 20 cm translucent white plastic or acrylic, such as Lexan® (by Sabic), Acrylite®, or Makrolon® (by Bayer), the materials most often used in the USA.
- Tripods with strong adjustable clamps can be used to hold and position the flashes. Alternatively, an assistant can hold flashes and release and position specimens.



↑ Checking background exposure with a MYN field studio setup.

Step by Step Protocol

1. Set up: Place your table on a flat spot, close to where you will collect your subjects. Set your camera and strobe exposure modes to manual. Position one flash directly under the table so that it evenly lights the entire underside of the plastic or acrylic sheet. Next, position the “fill” flash(es). Remember that the closer the diffused fill light is to the subject, the softer and lighter the shadows will be. Fill flashes are best mounted on sturdy tripods, but can also be mounted on the camera, or held by an assistant.

2. Test and calibrate the equipment: First find a test subject, such as a short twig, leaf, or stone and place it at the centre of the plastic. Next, run some trial shots to achieve the correct exposure of the background. If you have the blinking highlights option for your camera system, turn it on, as this will help you to see when the background has lost all detail. Next add in fill-flash at a lesser power setting than the flash behind the subject. Make sure the subject is well lit, without over- or under-exposure, or dark shadows. Once basic settings have been adjusted, including flash distance and angle, ISO value, shutter speed, aperture, and flash power, only minor adjustments to flash power should be made during the shoot as adjusting any of the basic camera settings (shutter speed/aperture/ISO) will throw off the background exposure.

3. Start shooting! Collect each animal in a separate clear plastic container. Keep containers shaded and cool, as amphibians are

liable to overheat. Place subject at the centre of the plastic sheet, covered by an upside-down transparent plastic container such as a food storage box or dish.

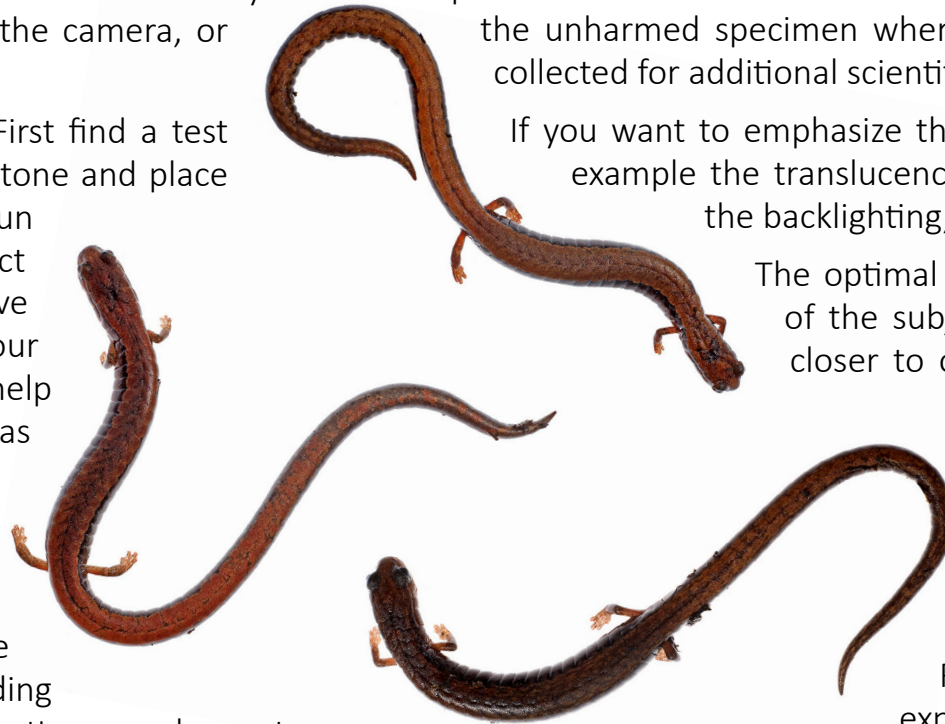
When the subject is calm, gently remove or lift the container. Frame up, whilst trying to maximize depth of field. An assistant can help to keep the subject positioned correctly. Shoot several images, and then re-cover while you inspect the results. If necessary, adjust flash power and reshoot. When ideal images have been obtained, release the unharmed specimen where it was found (unless it is being collected for additional scientific work).

If you want to emphasize the translucence of the subject, for example the translucence of a glass frog, slightly increase the backlighting, and diminish the front fill.

The optimal way to illustrate the translucence of the subject is by moving the background closer to or further away from the subject.

It may be necessary to use an additional layer of transparent material such as glass or Plexiglas® positioned above the white acrylic sheet in order to accomplish this.

For a more complete technical explanation of exposure, flash use, and RGB values the reader should refer to the Meet Your Neighbours website or the Field Studio ebook produced by Niall Benvie.



↑ (Centre) A composite image showing colour variation in *Batrachoseps attenuatus*.

Post-processing the Images

The resulting images can be processed with image processing software such as Adobe Lightroom, Photoshop, or Adobe Camera RAW. As with other types of photography the optimal image quality setting should be RAW. MYN images should need minimal processing, however it is important to check that the background is indeed pure white (255 for each RGB channel) and if not adjust exposure accordingly.

Producing Composite Images

The MYN method allows easy construction of composite figures. Because each image is surrounded by a pure white background, different subjects can be pasted into the same white document without any concerns over different backgrounds or tonal discontinuity, and more importantly, without having to cut out complex subjects. This not only saves time, but allows a natural gradient in the out of focus areas which can be troublesome with even the most advanced cut out filters.

When composing, you have the option of maintaining consistent



← MYN field studios can be used creatively to produce underwater images.

magnification ratios (so that subjects remain in true proportion to one another) and lighting (so that the different specimens look as if they were all shot under similar light conditions). In contrast, if the various elements of the composite image are converted to scalable objects in the graphics design software, they can be scaled non-destructively as they are rasterized. From a designer's perspective, this is very useful, as pictures can be dropped straight onto a white page and text laid out around them without having to make any additional selection.

Using MYN Images

MYN images draw attention to details normally unseen and unimagined by a general public, and therefore represent fantastic educational and outreach tools. They are used successfully in public displays and school programs to teach biology, raise awareness of biodiversity, and promote conservation. Likewise, composite-image sheets can convey a sense of biodiversity in a given area by illustrating the diversity of the region.

For scientists, MYN images can greatly enhance public presentations, scientific reports, grant applications, and teaching materials.

Displaying Variation

For scientists, where the MYN technique really shines is in documenting and illustrating the variation that exists both within and between species. Population and seasonal variation, sex-related differences, differences in shape, colour etc. can be clearly demonstrated.

↘ A composite image showing variation between the sexes in *Pseudacris regilla* (female, left, male, right).





↙ An undescribed species of *Diasporus* discovered at Cocobolo Nature Reserve in Panama. This image shows the usefulness of MYN for documenting species details.

Illustrating Development and Life History

The Meet Your Neighbours approach can be used to illustrate the different development stages of a species. This is particularly useful for demonstrating amphibian metamorphosis.

Composites showing all developmental stages from egg to adults can easily be produced from different shoots throughout the cycle.

Showing the various life stages of an amphibian on the same panel, without interference from foliage or other background details, promotes awareness and conservation and is a great educational tool.

Documenting Species Range and Phenology

The on-going accumulation of MYN images and associated data on the internet will help scientists to better understand the phenology and ranges of different species, and is especially important for documenting range-change and phenological disruption caused by climate change or habitat degradation.

Promoting Conservation

A key goal of macro photography is to bring forward some of the unsuspected beauty of life around us. Magnified images of tiny creatures create a sense of wonder in a non-specialist public. MYN macro-images open a door to an unknown world. This in turn

promotes awareness of one's natural surroundings and the need for environmental preservation.

Photography exhibits in schools, libraries, museums, or other public places are a great way to enhance public education in ecological matters, especially for children.

Technical scientific publications, although detailed and informative, often remain beyond the understanding of the general public. But simple, bright and colourful images can have a greater impact and stimulate the viewer to learn more about the biology of the animal or plant pictured. Simply put, images carry an emotional force that is often unrivalled by written text, and so much more if they are done in a minimalist style.

Learn more about the Meet Your Neighbours project by visiting www.meetyourneighbours.net or by connecting via [Facebook](#).

→ An American Toad (*Bufo americanus*) photographed using the MYN method.



10. Wide-angle Macro

The aim of wide-angle macro is to capture your subject and its surrounding environment. This is a particularly good technique for storytelling because it includes lots of information about a subject's natural history.



The big problem with wide-angle macro is that it requires you to get REALLY close to your subject. Traditional macro lenses often have slightly longer focal lengths to provide a greater working distance (distance between the lens and subject). Longer (telephoto) lenses compress the background so are less useful for including a subject's surroundings.



↑ A wide-angle macro shot of a Long-nosed Horned Frog (*Megophrys nasuta*) from Borneo clearly showing its forest floor habitat

There is only one dedicated wide-angle macro lens on the market, the Venus Laowa 15mm, which is fully manual, making it challenging to use. Standard wide angle lenses tend to have reasonably good close focus abilities, combining these with an 'extension tube' will enable you to focus even closer. Only the thinnest extension tubes should be used (<8mm if possible) as longer tubes will actually place the focal point behind the front element of the lens! Extension tubes with electrical contacts are infinitely easier to use as they allow full control of the aperture.

It goes almost without saying that wide-angle macro works best with subjects that are easily approachable. As the field of view is so wide, a lot of attention needs to be paid to the background when composing a shot, as well as any unnatural intruding elements such as flashes, tripods, feet and hands as these can easily be included!

11. Images for Identification

(Ariadne Angulo & Phil Bishop)

So far this book has discussed photographic and compositional techniques mainly in the context of telling a story. Photography is, however, also used for identification (ID) purposes: of species, of individuals and of symptoms of specific threat drivers. While many of the techniques covered earlier also apply to the process of taking ID shots, there are a few considerations worth taking into account for these specific purposes.

Species Identification

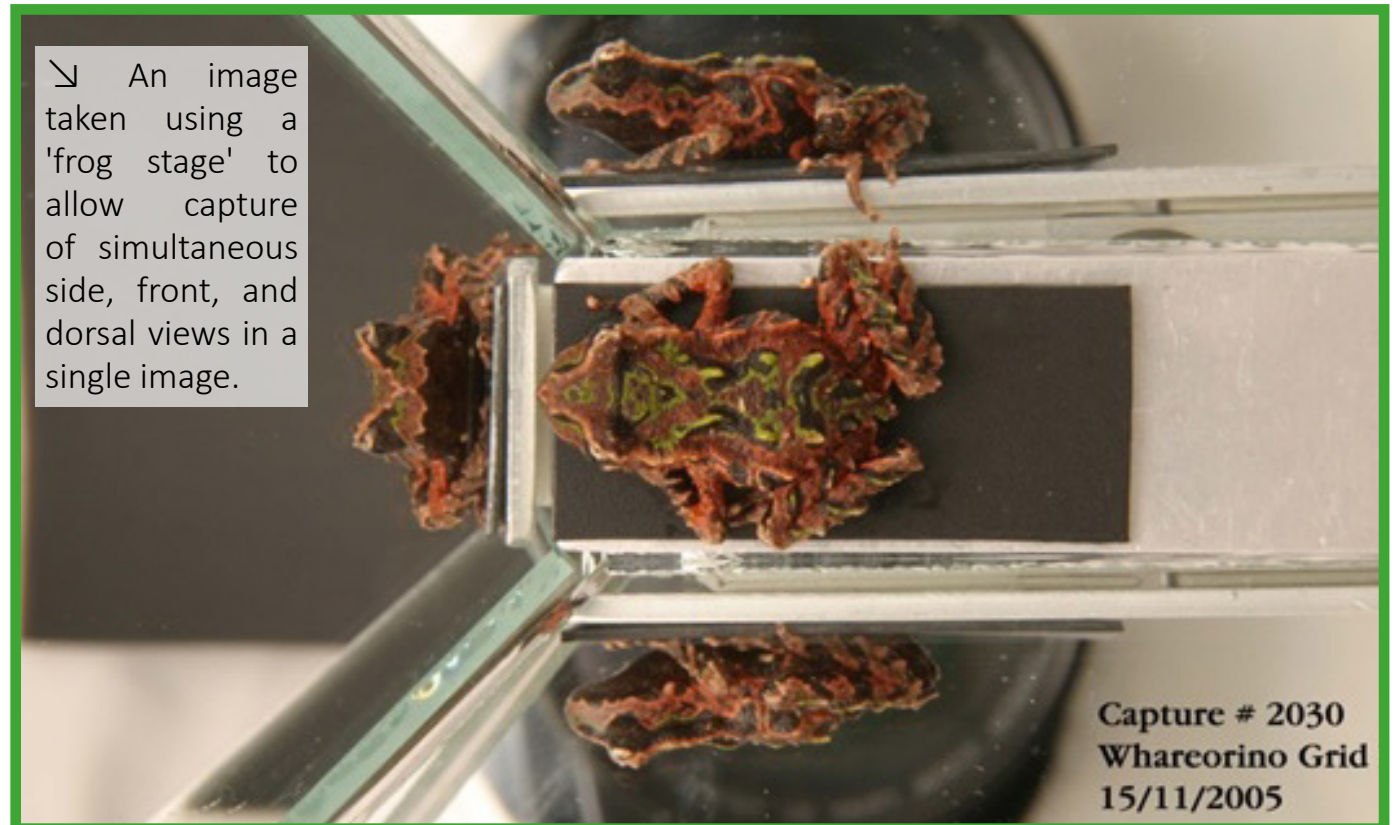
Nowadays new species descriptions and species revalidations almost always have photographic records of the type material, something which has been made possible thanks to the transition to digital formats, price reduction of consumer photographic equipment, and the availability of post-processing software.

Some key considerations when using photographs to describe new species or species revalidations is to document not only the overall morphology of the species, but also specific characters important for species diagnosis. Thus, it is common to see species descriptions that show the species not only

in lateral and ventral views, but also close-ups of the head, hands and feet, thighs, and any other area that may be relevant for species identification. Some of these images are accompanied by scale bars, allowing for gauging of the size of the body part/character relative to the body. Because the focus here is on facilitating species identification, for the most part the subject will be centred in the frame. The background will often be

homogeneous (typically white, black or grey) to allow for contrast with the subject, which is often already preserved for many of these images, and therefore natural colouration may have changed. Still, it is common to also see photos of the species in its natural habitat, or where there is morphological variation, of several live individuals depicting this variability.

↘ An image taken using a 'frog stage' to allow capture of simultaneous side, front, and dorsal views in a single image.



Individual Identification

Amphibians are notoriously difficult to individually mark as they frequently shed their skins and their mucous glands make it very difficult to stick anything to them, such as numbers or tags. While there has been some success with toe-clipping, Visible Implant Elastomers, Alphanumeric Tags and PIT tags, there is a growing demand for non-invasive techniques of individual recognition. If your amphibian has unique patterns then it is possible to use natural markings for photographic ID. In New Zealand, scientists have developed the 'frog stage', a small platform surrounded by mirrors and a scale bar, so that by taking one photograph, you can see the sides, front, and dorsal view. While this should be an easy method for identification, the computer software has yet to be developed to identify individual photographs, so it becomes a very time-consuming exercise. Recently developed software by Lex Hiby shows a lot of promise and may be the way forward to screen thousands of images to get a positive match.

The exact dimensions of the equipment for making a "frog stage" can be found on the amphibians.org website. We acknowledge the hard work of Avi Holzapfel at the New Zealand Department of Conservation in developing this tool.

Symptoms of Specific Threat Drivers

Some amphibian threat drivers may express themselves through general body condition and impact on individual well-being. In particular, diseases such as chytridiomycosis, ranavirus and bacterial infections may express themselves through very specific symptoms and lesions. Ecotoxins may also express themselves through specific lesions or malformations. In these cases, photographic identification of the symptoms and lesions may help field workers narrow down potential drivers impacting a particular amphibian. However, to better document

disease symptoms it may be necessary to expand the photographic toolbox to more detailed and specialized photos, such as microscope photography. Given their specialized nature and cost, it may be worth exploring the availability of microscope facilities and services at local university laboratories, institutes, hospitals, etc. It is important to note that while photographs may help narrow down potential threat drivers, ideally affected individuals or their samples may be specifically tested for these threat drivers in laboratory conditions.



↑ Chytrid-infected female *Atelopus limosus*.

12. Handling Amphibians

It goes without saying that any contact with amphibians should be minimised, especially in high risk areas for chytrid fungus and other infectious diseases. For the purposes of photography it is often possible to manipulate amphibians into a photogenic position without physical contact. When handling is necessary, using non-latex powder-free (e.g. nitrile) gloves or a disinfected plastic bag is recommended.

When working as a scientist, or working with scientists, collecting amphibians is often a necessary part of data collection. The opportunity can then be taken when the frog is released to get some images.

Often it is the case that more natural images can be achieved by not handling amphibians before trying to photograph them, especially when trying to capture behaviour such as calling. Many frogs also tend to lower their heads in a defensive pose when threatened and it can be difficult to manipulate them back into a natural posture afterwards. Another issue is that handling

or disturbance increases the chance of getting debris stuck to the skin, which can be distracting in an image.

Amphibians are different from a lot of other wildlife subjects in that many can be easily approached, and although the very active species present more of a challenge, many will sit perfectly to have their picture taken. General guidelines for approaching wildlife still apply, however, in that a slow and calm approach with minimal disturbance will be less likely to cause the frog to jump or lower its posture.

The main dangers when handling amphibians are: skin damage that could result in secondary skin infections and bone and muscle injuries caused by struggling when being held.

If handling, it is important to bear in mind the sensitivity of amphibian skin. Any chemicals, such as mosquito spray, sunscreen, etc. could be fatal to amphibians if it comes in contact with their skin. Another issue is the heat from a person's hand (and salt from perspiration) can dry out amphibian skin or even cause the animal to overheat if handled for too long.

Many amphibians are quite small and as such are relatively fragile, and should be handled gently. Some amphibians can be extremely slippery, especially when wet. This can make them difficult to hang on to, but it is important not to apply too much force. With frogs and toads, using two hands, you can allow the individual to slide from one hand to another whilst restricting its leg movement just enough to stop it jumping.



↑ *Centrolene antioquiensis* captured using a plastic bag, Colombia.

When handling frogs for too long, they can exhibit stress responses such as becoming limp. If this occurs, the frog should be returned immediately to the place where it was found.

The ethics of setting up a wildlife image or manipulating elements of the scene are hotly debated, with purists insisting that it is dishonest to manipulate a wild subject under any circumstances and that the scene should be recorded as found. Others are happy to relocate subjects to a more photogenic location and then release back where they were found. Where the balance falls on this question is up to the individual photographer, so long as the welfare of the animal is prioritised and any manipulation is not aiming to deceive.

Frog Handling Hygiene

- A new plastic bag or new powder-free nitrile gloves must be used for each amphibian when they are caught or handled.
- Within a local area the same gloves may be used for searching for amphibians, but they need to be changed if they come into contact with an individual. It is important to ensure that new gloves are used when moving between areas.
- If an individual displays signs of ill health or looks compromised in some way please

ensure a separate glove is used to handle these individuals. Different gloves should ideally be used for each new individual encountered.

- Each individual should be housed in a separate plastic bag.
- Ensure all handling and measuring equipment that comes into direct contact is disinfected prior to use, between individuals and between sites (a good disinfectant to use in conjunction with amphibians is Virkon S, and harsher chemicals such as bleach should be avoided unless any residue can be very thoroughly washed away. Please see below for a full list of disinfectants, dilutions and times for the effective cleaning of field equipment).
- Ensure the frogs are kept cool at all times; avoid keeping frogs in the cupped hand if possible.
- Minimise handling times to reduce stress and to avoid the side effects of stress.
- Sick or dead frogs should be collected and held separately from all other frogs until delivered to the appropriate recipient.
- All equipment should be cleaned and disinfected after use.



↑ Collecting frogs using individual plastic bags in Haiti.

13. Biosecurity

Emerging infectious diseases such as *Batrachochytrium dendrobatidis* (Bd or chytrid fungus), *Batrachochytrium salamandrivorans* (Bsal) and Ranaviruses have been implicated in amphibian declines worldwide. Not only can these potentially deadly pathogens readily spread through contact with infected soil and bodies of water, they can also be spread by people via our vehicles, boots, field gear and even camera gear.

As a photographer, there are several things that you can do in order to minimize the transmission risk of these diseases as you move from one site to another. Here is a simple checklist of key things you MUST do to help keep amphibians safe from disease:

1. Before you enter an area, remove ALL dirt from your field gear. This includes your shoes and any other protective clothing that may have come into contact with the ground, water and other amphibians.
2. After that, you must disinfect ALL of your field gear. Note that ALL dirt must be removed from your gear BEFORE you can properly disinfect these items.
3. After you have washed and disinfected all of your items, allow sufficient time for them to air dry COMPLETELY.
4. Also, remove ALL dirt from any field equipment and photography gear that you will be carrying into the field.

5. Are you bringing a dog along with you as well? Then be sure to disinfect your dog's paws. Ask your veterinarian about the best way to do this.

6. When you are not using any pieces of your gear, be sure to store them in a clean, dry area away from where you are working to avoid re-contaminating it.

7. Photography gear can and should be sterilized with $\geq 70\%$ ethanol or surgical antiseptic wipes. Allow the equipment to thoroughly air dry before reusing.

Once you have brushed and washed all the dirt/mud off your gear, what are you supposed to use to disinfect? The items in the table below can be readily purchased



↑ *Rana muscosa* being swabbed for Chytrid in Sierra Nevada, California, USA.

from your local veterinary clinic and can be used in the following concentrations for your gear:

Purpose	Disinfectant	Concentration	Time	Rinse
Disinfecting footwear/ gaiters	Sodium hypochlorite (bleach)	1%	1 min	Yes
	Hot Wash	4%	15 min	Yes
Disinfecting collection equipment, instruments and containers	Trigene/ SteriGene F10	1%	1 min	Yes
		1%	1 min	Yes
	Virkon (NB: corrosive)	1%	10 min	Yes
	Sodium hypochlorite (bleach)	1%	1 min	Yes
	Virkon (NB: corrosive)	4%	15 min	Yes
	Trigene F10	1%	1 min	Yes
		1%	1 min	Yes
	Ethanol	70%	1 min	Air Dry
	Complete drying		3+ hours	No
	Heat	37°C	4 hours	No
	Heat	60°C or greater	15 min	No
	Sterilising UV light		1 min	No

In addition to practicing strict hygiene, it is also important to minimize the handling of amphibians whenever possible. But if you absolutely must handle one, keep the

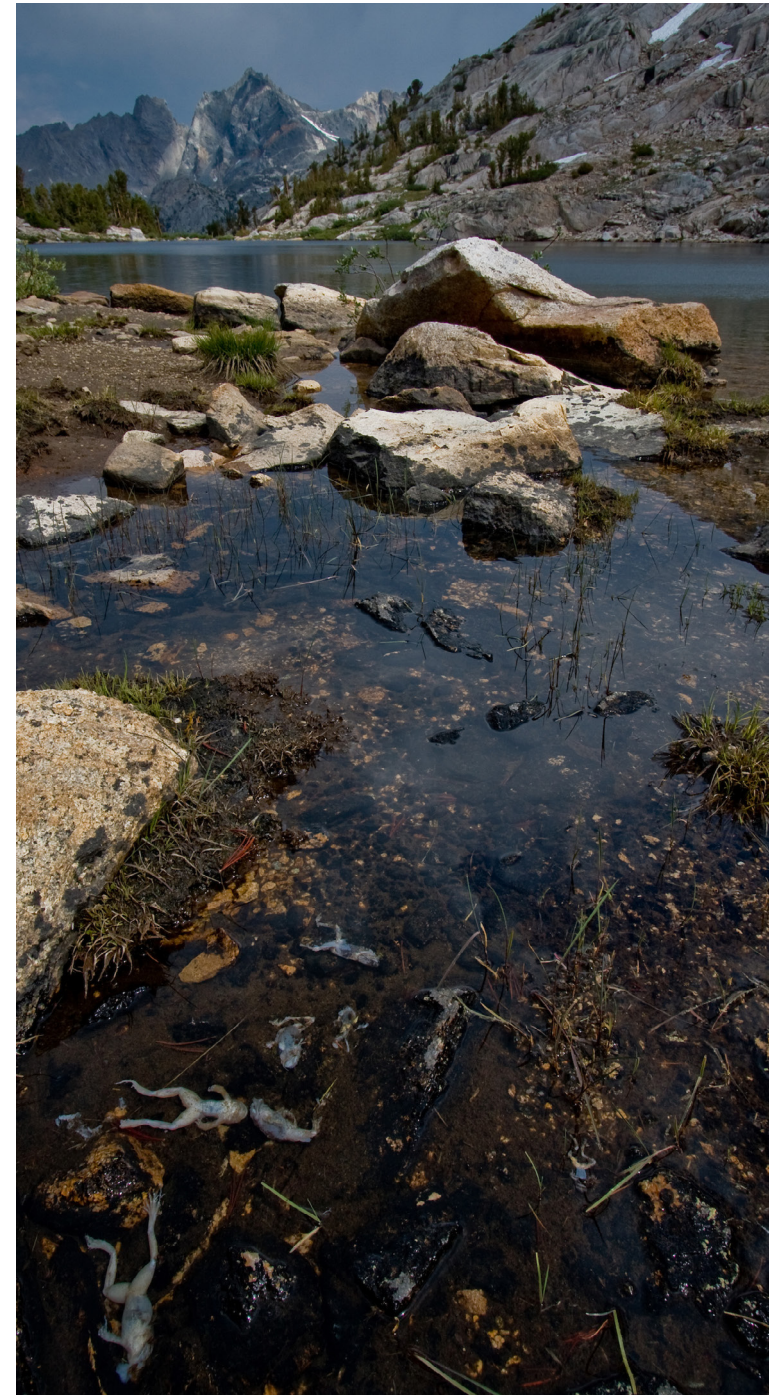
following guidelines in mind:

1. ALWAYS wear fresh powder-free nitrile gloves or place fresh plastic bag over your hands each time a different amphibian is handled.
2. In order to allow amphibians to properly regulate their body temperatures, DO NOT cup them in your hands whenever possible.

Because biosecurity protocols can change regularly as new research becomes available, especially as new diseases are found, you are advised to always check with amphibian conservation groups and organizations for the most relevant and up-to-date guidelines.

You can help. Check out this webpage for how to report a possible case of amphibian or reptile disease in Canada or the USA: <http://parcplace.org/resources/parc-disease-task-team/>

→ Dead frogs as a result of chytrid infection, Sierra Nevada, California, USA.



14. Dealing with the Elements

Amphibians and wet humid environments go hand in hand. Unfortunately, there is nothing worse for cameras than too much moisture. While completely soaking a camera will almost certainly stop it working for good, long-term exposure to humidity can also wreak havoc by corroding electronics and allowing mould to grow inside the lens. Condensation inside the lens can be difficult to remove, meaning missed photo opportunities.

Whilst you should endeavour to keep your camera safe and dry, there is little point owning one if you never use it for fear of it getting damaged. The key is knowing what steps to take to ensure it is as safe as it can be whilst still being used.

1. Use weather sealed gear. More expensive cameras generally have better weather sealing. It is not just the image quality you pay more money for, if you can afford it then fully weather sealed equipment is definitely worth getting.

2. Take LOTS of silica gel. Silica gel will absorb moisture from your camera equipment, helping to stop condensation, mould and corrosion. Silica gel will need to be replaced regularly, self-indicating gel will change colour when it needs to be changed. Some

types can also be reused; however, this will require a reasonably well-controlled oven to do properly. For emergency drying of wet equipment, rice can also be used as a desiccant. When using rice, ensure you use a cloth bag for the camera gear to avoid dust getting into your camera.

3. Take lots of sealable bags. There is no point in using silica gel if it is just absorbing moisture from the air. Strong plastic sealable bags are incredibly useful for smaller pieces of equipment. Water-tight roll top dry bags are stronger and work well with larger lenses or as an extra layer if you are not using a properly padded camera bag. Keeping everything in its own individual bag will reduce the exposure when accessing other gear.

4. Use water-tight hard cases. These are the best for keeping gear dry and are extremely tough. These are almost essential for expeditions where water is unavoidable but can also give peace of mind when travelling generally. Using these to store gear with plenty of silica gel can stop the encroachment of moisture when left for extended periods of time in humid areas.

5. Avoid Air-con. Air-conditioning is an insidious cause of condensation in camera

equipment. If unavoidable, keep your camera in a sealed bag and allow it to warm up before using.

6. GENTLY warm gear to remove condensation. Using a hair-dryer or leaving in the sun or even under an incandescent bulb can help, but be careful not to melt your gear!

7. Carry an umbrella. Umbrellas can help you to keep shooting in the rain. Rainy weather is the best time to find frogs. Using an umbrella or other rain cover can allow you to keep shooting even in a downpour, although it is much easier if you have an assistant to hold the umbrella for you.



↑ A hard case such as this will keep cameras safe even in the most extreme conditions.

15. Further Reading

- **The joint ASG and ASA website** - (www.amphibians.org).
- **The IUCN Red List of Threatened Species website** - (www.iucnredlist.org)
- **In Search of Lost Frogs** by Robin Moore (insearchoflostfrogs.com).
- **The Amphibians Ebook** by ASA/MYN ([Free Download](#)).
- **Threatened Amphibians of the World** by Simon Stuart et al. ([Free download](#)).
- **The Photographer's Eye: Composition and Design for Better Digital Photos** by Michael Freeman. (www.michaelfreemanphoto.com).
- **Native frog hygiene and handling protocols** - NZ Government, Department of Conservation.
- **Field Photography Stage** - NZ Government, Department of Conservation (<http://www.doc.govt.nz/nature/native-animals/reptiles-and-frogs/frogs-pepeketua/photo-stage/>).
- **Herpetofauna: photo-identification** - NZ Government, Department of Conservation (<http://www.doc.govt.nz/Documents/science-and-technical/inventory-monitoring/im-toolbox-herpetofauna-photo-identification-of-herpetofauna.pdf>).
- **The Field Studio Ebook** by Niall Benvie (niallbenvie.com).
- **Wide-Angle Macro: The Essential Guide** by Clay Bolt and Paul Harcourt Davies (learnmacro.com)



16. Image Details



Front Cover - Main Image
© Robin Hoskyns / www.robinhoskyns.co.uk
Boophis tasymena - Ranomafana, Madagascar.
Canon EOS 5D mkIII, 150mm macro lens, Manual, 1/200, f/11, ISO-200, Diffused off camera flash.



Front Cover - Bottom Left
© Robin Moore / www.robindmoore.com
Salamandra infraimmaculata - Tel Dan Reserve, Israel.
Canon EOS 5D mkII, 100mm macro lens, Manual, 1/60, f/18, ISO-640, Diffused flash.



Front Cover - Centre
© Robin Hoskyns / www.robinhoskyns.co.uk
Boophis luciae - Ranomafana, Madagascar.
Canon EOS 5D Mark III, 150mm macro lens, Manual, 1/200, f/10, ISO-200, Off camera flash placed under leaf.



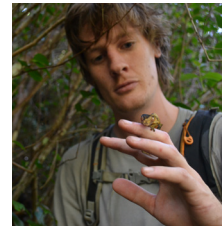
Front Cover - Bottom Right
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Clay Bolt photographing using a MYN field studio.
Canon EOS 5D mkIII, Aperture Priority, 17-40mm, 1/50, f/5, ISO-1250.



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Boophis luciae - Ranomafana, Madagascar.
Canon EOS 5D Mark III, 150mm macro lens, Manual, 1/200, f/11, ISO-200, Diffused flash with subject on softbox surface.



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© Robin Moore / www.robindmoore.com
Osteopilus pulchrilineatus - Massif de la Hotte, Haiti.
Canon EOS 5D mkII, 100mm macro lens, Manual, 1/125, f/25, ISO-125, MYN field studio.



Page 4
© Rachael Gerrie
Robin Hoskyns at Ranomafana National Park, Madagascar.
NIKON D3100, 18-55mm lens, Aperture Priority, 1/60, f/4, ISO-1600.



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Duellmanohyla soralia - Guatemala.
Canon EOS 5D mkII, 100mm macro lens, Manual, 1/160, f/11, ISO-500, Diffused flash.



Page 7
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Searching for frogs at night.
Canon EOS 5D mkII, 24mm, Manual, 1/20, f/8, ISO-3200.



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Hypsiboas boans - Cocobolo Nature Reserrve, Panama.
Canon EOS 5D mkIII, 15mm lens, Manual, 30sec, f/2.8, ISO-1250, Flash.



Page 9 - Right
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Espadarana prosoblepon in amplexus - Chocó, Colombia.
 Canon EOS 5D mkII, 100mm macro lens, Manual, 1/160, f/32, ISO-800, Diffused flash.



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 Black and white DSLR landscape.



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Boophis tasymena - Ranomafana, Madagascar.
 Canon EOS 5D Mark III, 150mm macro lens, Manual, 1/200, f/9, ISO-200, Off camera diffused flash.



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 Rainforest stream in Ranomafana National Park, Madagascar.
 Canon EOS 5D Mark III, 24-105mm lens, Aperture Priority, 1/2 sec, f/8, ISO-200, Tripod.



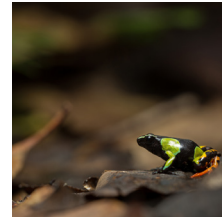
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Gephyromantis tschenki - Ranomafana, Madagascar.
 Canon EOS 5D Mark III, 150mm macro lens, Manual, 1/200, f/9, ISO-200, Off camera diffused flash.



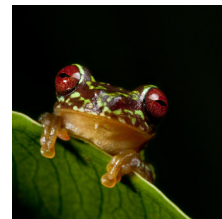
Page 17
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Boophis luciae - Ranomafana, Madagascar.
 Canon EOS 5D Mark III, 150mm macro lens, Manual, 1/200, f/11, ISO-200, Off camera diffused flash.



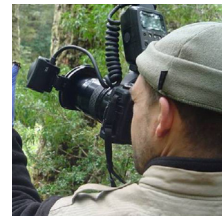
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Rana temporaria - UK
 Canon EOS 7D, 150mm macro lens, Aperture Priority, 1/320, f/4, ISO-400.



Page 19
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Mantella Baroni - Ranomafana, Madagascar.
 Canon EOS 5D Mark III, 150mm macro lens, Manual, 1/200, f/5.6, ISO-400, Off camera diffused flash.



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Duellmanohyla soralia - Guatemala.
 Canon EOS 5D mkII, 100mm macro lens, Manual, 1/160, f/11, ISO-500, Flash.



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Boophis reticulatus - Ranomafana, Madagascar.
 Canon EOS 5D Mark III, 150mm macro lens, Manual, 1/200, f/8, ISO-200, Off camera diffused flash.



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Agalychnis callidryas - In captivity.
 Canon EOS 5D Mark III, 150mm macro lens, Manual, 1/250, f/11, ISO-320, Ring flash.



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Cruziohyla calcarifer - In captivity at Bristol Zoo.
Canon EOS 5D Mark III, 150mm macro lens, Manual, 1/200, f/11, ISO-320, On camera flash.



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Cruziohyla calcarifer - In captivity at Bristol Zoo.
Canon EOS 5D Mark III, 150mm macro lens, Manual, 1/200, f/11, ISO-320, On camera diffused flash.



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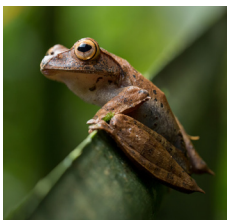
Cruziohyla calcarifer - In captivity at Bristol Zoo.
Canon EOS 5D Mark III, 150mm macro lens, Manual, 1/200, f/11, ISO-320, Off camera diffused flash.



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Ceratotriton guentheri - Solomon Islands
Canon EOS 5D mkII, 100mm macro lens, Manual, 1/200, f/32, ISO-160, Flash.



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Boophis madagascariensis - Ranomafana, Madagascar.
Canon EOS 5D Mark III, 150mm macro lens, Manual, 1/60, f/5.6, ISO-1600, Off camera diffused flash.



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Batrachoseps attenuatus (composite image) - Golden Gate National Recreation Area, California, USA.
MYN field studio.



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Pseudacris regilla (female, left, male, right) - San Francisco, California, USA.
MYN field studio.



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Rana clamitens - South Carolina, USA.
NIKON D300, 55mm Lens, Manual, 1/20, f/16, ISO-250, MYN field studio.



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Undescribed *Diasporus* species - Cocobolo Nature Reserve, Panama.
MYN field studio.



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Bufo americanus - South Carolina, USA.
MYN field studio.



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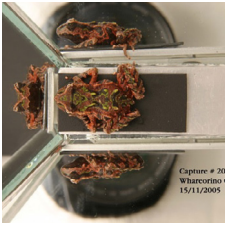
Ansonia latidisca - Sarawak, Borneo.
Canon EOS 5D mkIII, wide angle lens, Manual, 0.8sec, ISO-1600, Diffused flash.



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Megophrys nasuta - Sarawak, Borneo.
Canon EOS 5D mkIII, wide angle lens, Manual, 3.2 sec, ISO-640, Diffused flash.



Page 37
© DOC New Zealand
Frog imaging stage.



Page 38
© Brian Gratwicke
Chytrid-infected female *Atelopus limosus*.



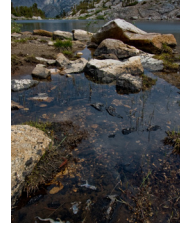
Page 39
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Centrolene antioquiensis in a plastic bag - Colombia.
Canon EOS 5D mkII, 17-40mm lens, Manual, 1/40, f/22 ISO-1000, Diffused flash.



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Blair Hedges frog collecting at Massif de la Hotte, Haiti.
Canon EOS 5D mkII, 100mm lens, Manual, 1/60, f/4.5 ISO-1000, Flash.



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Rana muscosa being swabbed for Chytrid - Sierra Nevada, California, USA.
Canon EOS 5D mkII, 17-40mm lens, Aperture Priority, 1/160, f/7.1, ISO-200.



Page 42
© Robin Moore / www.robindmoore.com
Dead frogs - Sierra Nevada, California, USA.
Canon EOS 40D, 12mm lens, Aperture Priority, 1/80, f/10, ISO-250.



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Ambystoma maculatum - Highlands Biological Station, North Carolina, USA
MYN field studio.



Final Page
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Smilisca phaeota - Chocó, Colombia.
Canon EOS 5D mkII, 100mm macro lens, Manual, 1/250, f/14, ISO-1000, Diffused flash.

