

EOC podcast script for episode 17

From Field Biologist to Filmmaker, part 2 – the Shooting Guide

You're listening to the Eyes on Conservation podcast, episode 17...

Welcome to the Eyes on Conservation podcast, where we bring you engaging conversations about wildlife conservation issues from all across the globe, I'm your host Matt Podolsky.

Today's episode of the show is a continuation of our ongoing series: From Field Biologist to Filmmaker. In the first installment of this series (which was released as EOC episode 9 – listen now if you haven't already!), we talked about the importance of the story outline. In this episode we'll be talking about camera equipment and shooting techniques. I'll also be sharing some anecdotes from my experience working on my first documentary film, Scavenger Hunt. This film is about the recovery of the California condor and the issue of lead poisoning in wildlife – it's actually a good fit for this month's theme of vulture conservation! If you haven't already, definitely check out the film – in addition to helping with this guide, it will also provide some important information about conserving vultures here in the American West.

So I'm going to jump right in where we left off here and assume that you already have a completed story outline that's been shared with all the people who you want to be involved in the film. If you crafted an interesting story, and pitched it in a compelling way in your outline, then you should have a crew of characters and volunteers excited and energized to help you make your story idea a reality. But how to proceed? It's time to start shooting, but this can be a daunting task to jump into if you don't have much production experience.

This is exactly the situation that I was in when I started working on Scavenger Hunt (my first documentary film project which I will be using as a reference point and example throughout this guide). I had a whole crew of volunteers excited to help out and energized about my story, but I had basically zero actual production experience. (I took one film production course in college and we shot everything on 16mm film!)

I had to start from scratch – not only did I need to learn shooting techniques – I needed to buy a video camera! Now this is a situation that I find fewer and fewer aspiring filmmakers in as time goes by. I started shooting for Scavenger Hunt back in 2008 – right on the cusp of the DSLR revolution that has taken over digital filmmaking. At the time I owned two cameras – an old Nikon film-based SLR, and an old Hi8 video camera that my parents used to use to shoot home videos when I was a kid. So I needed a new video camera, and DSLR's weren't yet a viable option for shooting HD video.

I ended up buying the Canon HV30 – a great little camera at a very reasonable price. The HV30 is an HDV camcorder, meaning that it records 1080i resolution footage to standard

DV tapes. While a tape-based camera would not be on the top of my recommendation list at this point – at the time it seemed like a pretty good option. Digital Video tapes are pretty much obsolete at this point – only a few years later! – but there are still lots of cameras on the market that are very similar to the HV30 as far as quality of footage is concerned. These days you can buy a small HD camcorder that records to an internal hard drive or SD cards (or both) for even less money than what I spent on my HV30. Of course what you want to do with your final film is going to play a role in the decision of what type of camera to shoot with. If you're producing something that will be released online, and rarely, if ever, shown up on a big screen – the HD camcorder route might be your best option. This is especially true if you have limited shooting experience. One of the huge benefits of these consumer-level camcorders is that so many of the functions of the camera are automated. Most of these camcorders have good autofocus systems, auto exposure, auto white balance – you can automate almost everything so that all you have to think about when your out in the field is framing your shot and pressing the record button. Even if you have higher ambitions for your film and want a higher quality camera for most of your shooting – having one of these small camcorders in your gear bag just for run-and-gun situations can be a really good idea.

Now as I mentioned earlier – a LOT has changed in the world of digital video since I started shooting for Scavenger Hunt back in 2008. There has been a revolution in digital filmmaking since that time, to be sure, and this revolution has been focused on using DSLR cameras – designed primarily for still photography – to capture film-like digital video images. So what's the difference between a camcorder designed specifically for video capture and a DSLR? Turns out there's quite a lot that is different between these two types of shooting devices.

One of the most important differences is the size of the image sensor. The image sensor is the equivalent of the film stock in a film camera – it is the point where all of the light is focused to create your image. One of the most fundamental differences between a small camcorder and a DSLR, is that most camcorders have a very small image sensor, whereas DSLRs have substantially larger image sensors. This turns out to be pretty important for a number of factors, including the overall quality of the image that you are capturing. With a smaller image sensor, even if your resolution is the same, you're mostly likely going to end up with noticeably lower quality image compared to something shot with a larger sensor. Part of the reason for this is that with a smaller image sensor the same amount of data is being crammed into a much smaller space. But another part of the reason for this is tied into a difference in the overall aesthetic of the image.

The size of the image sensor of your camera affects the depth of field that you are able to achieve in your shot. Depth of field is a measurement of the area within your shot that is in focus. With a larger image sensor, it is a whole lot easier to reduce your depth of field, and create a shot in which there is only a narrow range of area that will be in focus. Depth of field is also correlated to both the aperture you are shooting at, and your zoom range, but as a whole, you're going to have a lot more control over depth of field when working with the large image sensor found in a DSLR.

So why is this beneficial and what effect does it have on the quality of the image? Although it does not have an impact on the resolution of the image, it does have an impact on the perceived quality of the image for the viewer. This is because, as viewers, we are used to seeing a more narrow depth of field in high-end productions. Pay close attention next time you go to the theater and you'll notice that in many scenes this narrow depth of field is used as a tool to isolate the main subject of a shot. This helps the viewer know what they should be paying attention to within the shot. Sometimes the background will be just slightly out of focus – a sort of subtle hint as to where your attention should be focused – and sometimes the background will be completely blurred out, giving the viewer no choice as to what they should be paying attention to. So having the ability to make adjustments to your depth of field can actually be a great way to direct the attention of your viewers and show them what's important within a shot. It also provides the perception of a higher quality image, because viewers associate these depth of field effects with higher end productions (although most viewers are doing this unconsciously – it's still happening)

Now changing the size of a camera's image sensor affects more than just your control over depth of field. It also plays an important role in the angle of view that you will get with different lenses as well as your camera's sensitivity to light. If you will be shooting in low light conditions – a DSLR system is often a good way to go. That large image sensor is able to capture much higher quality images in low light conditions than any camcorder (unless you need to record in extreme low light conditions, in which case you'll want a camera with a removable IR filter. All cameras have an infrared filter for normal shooting conditions – but if you want to capture images in the absence of almost all visible light, some cameras have an option that allows you to basically slide this filter out from in front of the image sensor so that you can capture images in infrared. Unfortunately, camera companies are currently not legally allowed to offer this option on a camera unless it's branded as a "pro" camera – I guess they're concerned about people using IR cameras to spy on people... my old Hi8 video camera has the functionality and it's the main reason I've kept this old camera in my toolkit.)

Another benefit of a DSLR system is the fact that it is an interchangeable lens system. The lens plays a huge role in the end quality of the image that you capture – and with a small camcorder you're basically stuck with the built in zoom lens. You get what you pay for, as far as lenses go – they tend to hold their value pretty well – so if you buy an inexpensive camcorder, you're also buying an inexpensive lens. With a DSLR however – you have a whole lot more freedom when it comes to lenses. If you don't like the look of the kit lens that comes with the camera, you can go out and buy any lens you want and have a whole lot more control over your image. And there are LOTS of lenses out there to choose from! Not only do you have all of the modern lenses, which all have electrical connections to the DSLR camera bodies allowing you to control the aperture and focus automatically, but you have older lenses without these electrical connections to choose from as well. As long as you are comfortable adjusting focus and aperture manually (a lot of videographers prefer shooting this way regardless) you can get great deals on older lenses that can give you beautiful images. Of course the types of lenses that will be

compatible with your DSLR will be dependent on the model camera body you choose – but we'll get to that a bit later in the episode.

And now we get to the downside of utilizing a DSLR system for shooting video – which is that most DSLRs are not designed with video in mind. This has been changing in recent years, with more DSLRs including features that are appealing to videographers, but especially if you're working with a DSLR body that is a few years old, your video functionality will be a bit limited. There are lots of components to this, from just the simple ergonomics of the DSLR body, to specific features that we have come to expect with dedicated video cameras like focus and exposure assist. One of the most important factors to consider here however is the compression that is used to save the actual video file to your SD or CF card. Almost all DSLRs record H.264 footage – some limit resolution to 720p, some go to full 1080p, and there are variations as far as the frame rates that you can capture at. It's nice to have the option to record full 1080p footage at 60fps – twice the frame rate of standard video – since this allows you to slow the action down 2X – but it's actually rare to find this option on a DSLR.

So you have several options when confronted with the limitations presented by shooting video with your DSLR. One is to work with these limitations, and possibly supplement your shooting with a second camera, which you would use in situations when you need these video camera-specific functions such as auto focus and auto exposure. Another options would be to look into buying a hybrid – a camera that has many of the video functionalities that we've discussed, but also has many of the benefits of the DSLR. Mirrorless interchangeable lens system cameras have become increasingly popular over the past few years, with now every major camera company releasing a camera in this category. This system gives you the freedom of an interchangeable lens system, along with the ease of use and automatic video functions of a camcorder. There are a wide array of options in this category at this point, including cameras with full frame sensors (image sensor that is the same size as 35mm film).

This is the type of camera that I currently use as my primary camera. I bought a Panasonic GH3 before I started shooting for our half hour doc Bluebird Man, and I've been very happy with it. It has good options for compression formats, it has a micro 4/3 size image sensor (about half the size of a full frame 35mm size sensor) – which I actually like for shooting wildlife because it gets me in closer to my subject with less telephoto range on the lens. The two downsides to this camera: 1. The electronic viewfinder – because this is a mirrorless system, the image you see on the screen and when you look through the viewfinder is not the perfect optical image you get with a true DSLR. This makes it more difficult to get that perfect, crisp focus when your focusing manually (which I usually do). 2. Wide angle lenses are expensive! And older manual lenses don't give you the same wide angle perspective because of the smaller image sensor. As I mentioned earlier – the size of the image sensor affects the angle of view that you get with any given lens. Micro 4/3 image sensors have a 2X crop factor, which means that when I put a 20mm lens on my camera, the angle of view I get is the equivalent of what I would see with a 40mm lens on a film camera – or a camera with a full frame size image sensor. You can understand how this would make it difficult to

find wide angle lenses – camera companies have had to design lenses specifically for this system that have small focal distances to allow users to get that wide angle perspective. And these new wide angle lenses are expensive! I've been saving up for Panasonic's ultra wide angle zoom lens for a while now – it costs almost 1K!

Now I can't move on to our shooting techniques section without mentioning a few particularly interesting new camera options that have had a dramatic impact on the market and shifted things significantly in the DSLR video revolution. The Black Magic camera is a large image sensor camera designed specifically for video. They call it a "cinema camera" because it is designed to replicate the look of a film-based movie camera. Now Canon has also introduced a whole new line of "cinema cameras" within the past few years, but there are a few things that make the Black Magic camera really stand out. First is cost – Canon's line of cinema cameras are prohibitively expensive for most folks who are just starting out in the world of videography, whereas the Black Magic cameras are quite reasonable. Second is the options for compression of the output file on the Black Magic. While Canon's cinema cameras have basically the same options for output file as their traditional DSLR bodies (the standard H.264) – Black Magic cameras have the option of recording to RAW DNG files! While shooting RAW video isn't the best option in many circumstances – it takes up lots of memory and space on your SD card – it is very cool to have this option on a camera. Until the release of the Black Magic, you would have had to spend 10s of thousands on a video camera to get this feature – and you can buy a Black Magic pocket camera for less than 1K! These cameras also give you the option of recording prores 422 files – which I see as a preferable over H.264, although they will take up more space on your card.

So the Black Magic cameras come with all these amazing features right out of the box, but there's another option for folks who are looking to shoot RAW video – Magic Lantern. Magic Lantern is an open source alternative operating system for your older model Canon DSLRs. This is definitely something that will void your warranty on the camera – but it can allow you to shoot super high quality RAW video with that older Canon DSLR that you have laying around – which is pretty amazing. Magic Lantern also has a bunch of other improvements on the standard operating system of your DSLR – basically providing options that are standard on most dedicated video cameras such as focus and exposure assist (not automatic, but options to assist with manual focus and exposure adjustments). This is pretty amazing, given that you could jump onto craigslist right now and find an old Canon T2i selling for between 200-300 bucks, then load FREE third-party software onto it and have a video camera that shoots RAW video. While this is probably not the best option for a newcomer to the world of wildlife videography – it is an important option to be aware of as you develop your skills and start thinking about options for upgrading your equipment – especially if you're on a tight budget!

So the bottom line here is this: if you're just getting started and you already have a DSLR that is capable of shooting video – stick with it! Any maybe buy an inexpensive consumer level camcorder to supplement if you feel it's necessary. Of course, having the right equipment does not equate to capturing high quality, compelling footage. While it

is important to have the right tools, it is how you use those tools that will really make your story come alive.

Now assuming that you already put the work into creating your story outline, I would say that there are two critically important steps to take to ensure that you capture the footage necessary to tell your story in a compelling way. First is simply the ability to recognize where you need to be to tell your story in a way that is action-driven. We talked a lot about this in the episode about story outline, but it is one thing to create in your mind the theoretically perfect action sequence to convey a story point, and quite another to actually make sure you are in the right place at the right time to capture the action of an event. When shooting for documentaries, action scenes rarely play out in exactly the way that you expect or hope them to, and the ability to recognize what is important to capture in the moment is critically important. This is a skill that is developed over time and with experience, but if you're just starting out you should just be mentally prepared for the unexpected and be ready to capture whatever ends up happening.

Our second important step to ensure that you capture everything you need or want for an action scene is to create a shot list. You basically have to take your story out line to the next level here, and do your best to envision what you want a particular action scene to look like. When you're on a run-and-gun style shoot just trying to capture as much of the action as possible, it is easy to forget about your establishing shots. Think about what shots you need or want to establish a sense of place. Maybe you want some travel shots to show viewers what it takes to get to a particular location. Maybe there's something specific within the action that you want to make sure you get some close-up shots of.

Now here is where I admit that creating shot lists was something that I failed to do while shooting for Scavenger Hunt – and I regretted it! Much of the shooting I did for Scavenger Hunt was spur of the moment – I was working on the condor crew as a field biologist for much of this time, and I figured that if I missed a shot, I could always get it later. After all, I was living and working with these birds every day! Although it did end up with plenty of footage to tell my story, it was a struggle to find the right clips to piece everything together in a coherent way. There were countless times in the editing room where I wished that I had gotten a particular shot the same day I recorded an action sequence. Instead we ended up pulling shots from previous shoots, and often times this resulted in a less than ideal edit.

In comparison, when shooting for our half hour documentary Bluebird Man I did compile shot lists every time before heading out in the field for a day of shooting. It is amazing the difference that this simple step made! Not only did it make the editing process a whole lot easier, but it resulted in a better told and more compelling story overall.

Now I've saved what is perhaps the most important component of a successful documentary video shoot for last – recording your audio. I cannot over-stress the importance of good quality audio for a documentary. I believe that it is MORE important than your video quality. Viewers will be forgiving of lower quality video if you have a compelling story – but if you have low quality audio you have no story. Your dialogue is

what tells your story, and if folks can understand what someone is saying you don't have a story. Poor quality audio can be very distracting – significantly more so than lower quality images, so you really have to pay special attention to your audio. Recording high quality audio can often be a challenge – especially if you're shooting an action scene and really need to get crisp recordings of dialogue in the field. But, here are a few tips for making sure that you capture that dialogue you need when out in the field.

Set up your main character with a lavalier mic. There are a couple of ways to do this when working in outdoor field conditions where a wired microphone connected directly to your camera is not an option. The first (and most expensive) is to buy a wireless lavaleir setup. A high quality wireless lav will run you 600-800 bucks, but it is a very nice tool to have in your kit. It allows you to capture your character's dialogue when in the field, just like you were sitting down for an interview. It is also very nice to have your audio synced up with the video file right from the beginning.

The second option is to buy a small field recorder – I use a Zoom H1 – with a simple 1/8 inch external mic input, as well as an inexpensive wired lavaleir (I've bought half a dozen of the Audio technica ATR3350 lav mics – they're very cheap and sound great!). These two items will run you between 100-150 bucks. Before heading out in the field you set up your subject with the lavalier mic, connect it to the field recorder, then tell them to put the field recorder in their pocket. Make sure the levels are good, then you just have to remember to turn the thing on and press record before you start shooting! An added benefit to this setup over the wireless lav is that it doesn't matter how far away your subject gets, you know you'll have good clean audio no matter where they are (as long as you don't run out of battery power or space on your SD card!)

It's also a good idea to have a shotgun mic recording audio during your shoot. Now in an ideal world you would have two people helping out with a shoot – one person in charge of video recording and one in charge of audio. IF you have a dedicated person for recording audio, I would recommend the use of a field recorder (another one in addition to the one that's in your subject's pocket.) I use a Foxtex FR-LE in situations like this – it has two XLR inputs so you can connect a high-quality shotgun mic as well as a lavalier. This does create some added post-production work – in syncing up your audio to your video, but luckily for us there is now software available that automatically syncs footage for you – the days of starting out each shot with a clapboard are over!

Now if you are running a shoot by yourself (as I often do), a good option is to have a small shotgun mic attached to the top of your camera. Back in the day of tape-based video cameras this was a big no-no since the mic would pick up the hissing and clicking of the tape motor inside the camera. But these days digital video cameras are pretty much silent, and you can get good quality audio this way as long as your mindful to reduce the noise you make in holding and operating the camera. I will stress that even if you have your subject wired up with a lav and a separate small field recorder, it's still a good idea to have that shotgun mic hooked up. That way you have two audio options to choose from, or if you forget to press record on the field recorder in your subject's pocket (as I've done a few times before!), you still have a usable audio track to work with.

When shooting for Scavenger Hunt, one of my first purchases was an audio field recorder (that Fostex FR-LE I mentioned earlier) as well as a shotgun mic and a wired lavalier. This setup worked great for interviews, but for action sequences I ran into some issues. I didn't have a way to wire up my subjects with the lavalier when shooting action out in the field, and for most of my shoots I was by myself and didn't have enough hands to lug my bulky field recorder and high quality shotgun mic around. So I relied on the audio from my small shotgun mic attached to the top of my camcorder. Now this was a decent mic – the kind that plugs directly into the 1/8 inch external mic input on the camera, but as I mentioned earlier – I was using a tape-based camcorder which means that the high frequency hum of the tape motor was ever-present in the mix. Because this was the only audio track I recorded for many of my action sequences in the film – we had to figure out how to eliminate this very distracting background noise. We ended up paying someone to identify the frequencies present in this background noise and eliminate them from these audio tracks. This took many hours of work and resulted in us going over budget for our audio mix. PLUS – the audio quality in these scenes was still not ideal. The problem frequencies had been eliminated, but this had changed the sound of the dialogue in the mix. If I had used a lavalier mic connected to a small field recorder I would have gotten much better quality audio, and spent significantly less money overall.

So let's recap:

- We've learned that there are LOTS of camera options, and that the advent of the use of the DSLR for video has dramatically changed the landscape in just a few short years.
- If you're just starting out as a videographer – use the camera that you have available at your disposal if at all possible. Chances are that DSLR you've been using to capture stills is also capable of collecting really nice video.
- If you're looking to move beyond the restrictions of a standard DSLR or consumer-level camcorder – think about mirrorless options – specifically the Black Magic cameras. If you're looking to move to the next level and are on a very limited budget, do some research on the Magic Lantern operating system for older Canon DSLRs
- Be sure to create a shot list before heading out into the field for a shoot.
- Be flexible when you out shooting in the field, and be ready to capture the unexpected!
- Don't forget about audio! Have a plan for how you will capture high quality audio when out in the field.

So there it is – part two in my transition from field biologist to filmmaker. This was a dramatic step for me since I had practically zero production experience when I jumped into shooting for my film Scavenger Hunt. Writing the story outline seemed quite easy in comparison for me, simply because I had to develop a whole new skill set to start shooting. I learned a lot of hard lessons while shooting for this first film, and I continue to learn things while out on shoots today. So I guess I would say that as important as it is to be prepared before heading out in the field, the lessons that you learn from experience will stick with you a whole lot longer than theoretical knowledge. At a certain point, you just have to jump in, get out there and start shooting! You'll make mistakes, that's

inevitable, but hopefully you'll learn from them and be better prepared the next time around.

And of course if you have any questions about any of the topics that I've been discussing here you can head over to our show notes page for this episode and leave a comment. I'll be reading all these comments and doing my best to respond to any questions that folks might have. You can find those show notes at: wildlensinc.org/eoc17.

We are also in the process of designing a brand new how-to section on the Eyes on Conservation website, which will include a way for listeners to pitch story ideas for wildlife or conservation themed docs directly to our team of Eyes on Conservation producers. Keep you eye on our brand new website – eyesonconservation.org – for this new section and the opportunity to pitch your story. Many of our Eyes on Conservation videos come directly from our growing community of aspiring wildlife filmmakers – each year we select a handful of story ideas to develop into EOC docs which are released as a part of the series and screen at film festivals, education centers and classrooms all across the world!

If there are folks out there who haven't yet seen my feature film, Scavenger Hunt – you can watch it at: scavengerhuntfilm.com – or head over to the show notes page for this episode and follow the link to watch. I'll also have some links to additional resources up on the show notes page – so if you're curious to learn more about the video and audio gear that I discussed here definitely head on over. Wildlensinc.org/eoc17.

This episode was produced by myself, your host Matt Podolsky. Our theme music is by the Humidors. Wild