CHRIS BATES

Scafell Crag on the recce day

A gathering of drones: pulling your eyes over the wool

Shepherds gathering their flocks in field exercises have been the subject of a familiar fixture in the TV schedule – and no doubt also in the work diary of some GTC members past and present – thanks to *One Man and His Dog*. When director **Johnny Shipley** was called upon to shepherd his own flock of camera crew to capture the extreme 'off-road' adventures of a mountainside shepherd in his natural habitat, for BBC Four's *The Great Mountain Sheep Gather*, he knew that the skies were not so much the limit, but the only path to take.

Drone photography has permeated every genre of television and film. The whirlwind evolution of this technology provides filmmakers with camera angles and moves that would have been impossible to shoot just 10 years ago. However, like its predecessor the helicopter, the drone usually plays second fiddle to 'flightless cameras' that continue to generate the lion's share of the content. *The Great Mountain Sheep Gather* provided an opportunity to turn the tables.

Conception

The Windfall Films development team conceived the project out of another series that Windfall makes for National Geographic: *Europe From Above*. In that series, each episode paints a portrait of a different country by documenting a


KIRK WATSON

Kirk's Inspire 2 on Sampson's Stones, beneath the unexpected fleecy fog

variety of places and events, all predominantly shot by drone (hence the title). The programme featuring the UK included a sequence following a shepherd 'gathering' his flock of sheep down to the farm in the Lake District. The five-minute segment proved to be a favourite with both the network and the production team at Windfall, who saw more potential in the story.

BBC Arts also recognised this potential and commissioned a two-hour film for broadcast on BBC Four. Stylistically, the original concept was a blend of documentary and 'slow TV', with a healthy dose of arts. The latter would be provided by specially commissioned poetry, inspired by the footage and an interview with the shepherd.

It was a big ask to produce enough content to engage an audience over such a long slot. First off, the production team needed to fully understand the timeline and logistics of this extraordinary event.

The gather

As any visitor to the upper fells of the Lakes will know, sheep are an intrinsic part of the landscape, but the Herdwick is the only breed that can survive there all year round. Despite the hostile conditions, one shepherd, Andrew Harrison, has a flock that lives on Sca Fell and Scafell Pike – England's two highest peaks.

At various points in the year, Andrew needs to bring his flock down to the farm for scanning, lambing, shearing, etc., with each 'gather' taking three days to complete. On the first day, he rounds up the sheep on the lower part of the fell, the following day he does the same for the mid fell, and on the final day he walks right to the top of both mountains as he circles around the upper fell to the limits of his allocated area.

Andrew has a team of other shepherds and their dogs helping him so they can fan out to make sure every sheep is found and steered safely back to the farm. Rounding up several hundred sheep that are spread over 1,200 acres of steep, craggy mountains with no walls or fences and no road access is no mean feat. Filming the event turned out to be an equally monumental challenge.

Mountains to climb

There are no roads up Sca Fell and Scafell Pike – the peaks can't even be accessed by quad bike. This meant the kit needed to be mobile and the crew fit! The million-dollar question was: how many drone units do you need to cover an event taking place over such a large area?

The shepherds, dogs and sheep move fast; once they had passed one drone position, it would be impossible for that unit to overtake them again. After consulting the budget, the production team agreed on a crew of six teams – four of them would fly with DJI Inspire 2 drones, the other two with DJI Mavic 2 Pros.

Windfall's contacts from other 'drone shows' (*Europe From Above*, *Hidden Britain By Drone*) were a good starting point for finding some of the UK's top UAV operators. Whereas most drone assignments require shots that can be used for maybe 10–15 seconds, for this project the hope was that some shots would last up to 10 minutes without a cut. To do this, the footage would need to develop and engage viewers, and this would be just one of the challenges faced by the drone teams.

The weather was the big unknown. To fly, UAV pilots need fairly clement conditions – ideally low winds and good visibility. Thankfully, shepherd Andrew also likes to gather in good weather to maximise the chances of locating all his sheep. But this meant he could only confirm that each day's planned activity would be going ahead early on the morning itself – a major obstacle and logistical risk for the production when hiring and assembling six drone units, a sound recordist, plus support staff, in a remote corner of the Lake District.

The plan

The original plan was to film only on the day of the high fell gather, the final and most spectacular chapter of the three-day event. The whole team would travel up to the area two days before, have one day to recce the route together and then rest up before the shoot day. Unfortunately, as the weather deteriorated and the forecast for the final day looked increasingly ominous, it was time to draw up a plan B.

The recce

David Dugan, the on-location exec producer, decided it would be prudent to film the second day of the gather in addition to the third as this would provide some insurance if the last day had to be postponed. However, this meant that everything needed to be brought forward by a day and, given that it was July – the height of the filming season – only some of the crew were able to come early and join the recce. Those

The trial run of dog cam, using the GoPro Fusion, went well…

…and led to some wonderful shots from sheepdog Jem's perspective

who could were treated to a 13-mile walk, enjoying the Lakes at their finest: clear blue skies and hardly a wisp of wind. The irony was that we had UAV operators, perfect conditions for flying drones… just nothing to film. Typical! But still, it wasn't wasted, as drone camera op Kirk Watson explains: *"We climbed up to the summit and down the other side, marking positions and thinking up rough shot plans with reveals over cliffs and big, cool summit shots, etc. This would help us and the drone crews to have a location and some starting ideas."*

That evening, we quickly tweaked the plans for the drone positions to account for shooting over two days rather than one. As the final few crew members arrived, it was a rare opportunity for a group of UAV operators to themselves 'gather' under one roof and exchange knowledge and anecdotes. As GTC member Mark Stokes observed: *"Flying a drone in the UK is almost always about avoiding other users in the air, keeping safe working distances and nearly always it's a solitary procedure, but the next day on top of the stunning fells was to see us have half a dozen or more UAVs airborne chasing a shepherd and his very woolly flock. It was going to be an epic day."*

The shoot

Andrew's confirmation that the day's activities were going ahead only came at 4am each morning, once he'd looked out of the front door of the farmhouse to check that he could see the nearby peaks. Who needs forecasts?

Transporting all our equipment up England's two tallest mountains was always going to require some degree of coordination and compromise. Thankfully, all but one of the units operating the larger Inspire 2 drones were dual operator teams, so they could share the load of the large quantity of heavier batteries needed for this shoot. The production had engaged the services of some mountain safety experts who were primarily there to guide and respond with assistance (if necessary) but, as importantly, to help carry enough batteries – for example, Mark and fellow GTC member Nik Porter gratefully shared their 12 pairs of batteries with guide, Mandy.

Three of the units ascended the peaks from the far side of Scafell Pike, which is a shorter (but steeper) climb, whilst the others took the longer route and had to set off an hour before the shepherding team in order to be in position ready for their arrival.

Of course, communication was essential and yet it wasn't always possible. There was no phone reception across the whole route, so each unit had radios, but the range was restrictive and the countless gargantuan crags often meant even neighbouring units couldn't communicate. It would come down to planning and patience, but then once a few hundred sheep merge into one flock they are hard to miss. Or that was the theory.

The fog

As the teams hiked towards the peaks on the second shooting day, it was evident the Lake District weather was living up to its infamous reputation. The higher they went, the more the wind picked up and the visibility dropped. The plan for developing shots featuring endless vistas before picking out the shepherd appearing on the horizon quickly went out the window once we realised that finding the shepherd at all was looking increasingly unlikely.

GTC member John Livesey sums up the frustrations: *"Capturing serene, sunlit water glinting at the base of verdant valleys topped with dramatic craggy peaks, further enhanced by the addition of a diligent shepherd patiently guiding their flock down from the slopes on camera – and from the air no less – looks nothing short of stunning. But, when the weather closes in during the pre-dawn darkness and fog enshrouds those dramatic peaks and crags, it becomes very difficult to coordinate multiple drone teams around a surprisingly nimble shepherd. The number of beatific shots dwindles and lining up flight paths which render the best backdrops becomes more challenging. Pilots get nervous enough when*

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DAVID DUGAN

Kirk keeps up with his drone as it keeps up with shepherd Andrew's nimble progress through the fog

diminished visibility brings such doubts as 'Have we missed the flock?', 'Are they in the fog further up the slope?' or 'Are they just not here yet? We're burning through the battery!'. This is intensified if they also need to consider 'Where's the other nearby team? Can you hear their drone?'."

Thankfully, Andrew followed the route as described and the teams were able to intercept him and capture some incredible shots as he and his dogs disappeared in and out of the fog doing their best to locate the elusive sheep.

In the nick of time

Foxes Tarn, on the side of Sca Fell and one of the most challenging drone positions, was where Mark and Nik were stationed. A two-person crew was essential there so that one set of eyes could always be on the drone, while the other could concentrate on directing the camera and asking for movement and speed adjustments.

After hovering and staring into the 'fleecy' fog for more than 10 minutes, and with no way of knowing exactly when the shepherd would appear out of the mist, Mark had to make the tough call to land and do a swift battery change; it was a gamble. *"Foxes Tarn is a narrow, steep and rocky gully with precipitous sides. We had to fly and operate with little margin for error within the confines of the gully. Weather is often the defining factor when flying. You can own the weather, but you can't drone the weather.*

"After a record-quick pit stop by Nik, props checked and lens cleaned, we were airborne again and back up recording, when almost immediately the shepherd was there; he arrived out of the swirl as though he was gliding. To witness this balletic movement of a man, his dogs and his flock over boulders and rocks, all slippery and mossy green, was truly incredible. Nik and I don't only do aerial work, we are both DoPs who often film outdoors and in the hills using ground-based kit. No other method – cameras, gimbal or GoPro – could have captured this almost silent dance of the shepherd and his flock down Foxes Tarn the way the UAV did.

"It was only after we had packed up, stumbled and bum-slid down that we fully realised the skills involved and appreciated the graceful and sure-footed way our shepherd had just flowed over the Sca Fell terrain."

This was something that Kirk Watson had already discovered for himself, up on the craggy summit, where low visibility and challenging flying conditions forced him to go mobile in true 'mountain goat' style over treacherous territory, so as to maintain visuals with his Inspire 2: "*Now, I'm not an unfit man – I'm a mountain instructor with a decade of my life spent teaching summer and winter climbing all over the place – but, man, Andrew could move! I was to meet him on the summit at 6am to start filming. I got there at 5.20am, in the cloud, wind and drizzle. Andrew arrived out of the mist one minute after me, just as I'd removed my rucksack. I was like 'Oh, you're early, can you give me 5 minutes just to get ready?', 'I'll give you one or I'll lose half the sheep.' I built my drone in super-quick speed and launched it; the only thing I could do with 50m visibility was fly with Andrew and walk at the same time over the boulders! My amazing, elaborate summit shots were reduced to slow, wind-buffeted shots of shepherd and dogs just visible: atmospheric, or so I told myself.*"

Shepherd/dog/sheep cam

Although drones were tasked with capturing the majority of the content for the film, there was a limit to how close they could fly to 'the cast'. To provide a more intimate angle, we employed three GoPro Fusions, which were attached to: the shepherd, using a chest mount; a dog, using a dog harness; and a

CREW (location)

UAV OPERATORS
Chris Bates
Mike Foyle
John Livesey
Will Moore
Sam Pierpoint
Nik Porter
Johnny Shipley
Mark Stokes
Kirk Watson

SHEARING CAMERA OPERATOR
John Livesey

SHEARING GIMBAL OPERATOR
Will Moore

SOUND RECORDIST
Peter Gill

LOCATION PRODUCER (SHEEP CAM FITTER)
Lucy Haken

LOCATION EXEC
David Dugan

DIRECTOR
Johnny Shipley

KIT

UAVs
- 2 x DJI Inspire 2 UAV with Zenmuse X5S (Super 35 sensor, shooting 4K, D-Log, ProRes 422 HQ)
- 2 x DJI Inspire 2 UAV with Zenmuse X7 (Super 35 sensor, shooting 4K, D-Log, ProRes 422 HQ)
- 2 x DJI Mavic 2 Pro (1" sensor, shooting 4K, D-Log, H.265)

GROUND CAMERAS
- 1 x Sony a7s II (35mm sensor, shooting 4K, S-Log3, XAVC-S)
- 1 x Sony a7 III (35mm sensor, shooting 4K, S-Log3, XAVC-S)

BODY CAMERAS
- 3 x GoPro Fusion
- 2 x GoPro Fetch Dog (/Sheep!) harness
- 1 x GoPro 'Chesty' Performance chest mount

SHEARING SHED
- Blackmagic URSA Mini Pro (Super 35 sensor, shooting 4K, 'film', ProRes 422 HQ)
- Schneider Xenon primes: 25mm, 50mm, 100mm
- Canon L series 70–200mm Mk2
- DJI Ronin with extended arms and radio control
- PDMovie Remote Air 2 wireless follow-focus
- Nyrius Pro video link on Blackmagic monitor
- Intel-A-Jib Pro 3.1m
- Panther Twister Dolly on Moy track

DoP John picks up some tight shots on a long lens, on the dolly in the shearing shed

sheep, using a… dog harness.

The Fusion was selected, not for its 360° capabilities, but for the incredible stabilisation that has been developed to work with the technology. Attaching a gimbal to a shepherd would have been tricky (and nigh on impossible for the dog and sheep), but the Fusions generated footage with a very similar end result. A big benefit of 360° recording is that the shots can be rotated in post without additional cropping. This was essential on this production as the camera and mount gradually slid down the ewe's left shoulder as she descended the mountain.

Together, the three cameras produced some of the most memorable images from the film, which were a perfect counterpoint to the wider, expansive drone photography. They also compensated for the limited amount of UAV flying possible in the dense fog that shrouded the peaks.

The long shot that did just work!

Luckily, the weather began to clear down in the valley and, thanks to the increased line-of-sight visibility, it was finally possible to execute longer shots with the drones. The longest in the final film (7 mins 30 secs) was captured by Kirk, who was operating his Inspire 2 solo: *"This has the benefit of the fact I am the only person who needs to know what is going on with my shot, but also means I must both fly and operate the camera's gimbal and do it all perfectly smoothly. This makes for some brain overload moments as one's fingers and thumbs all do their own things."*

> Achieving fluid, languorous shots in a tight space meant moving the dolly, jib and Ronin all exceptionally slowly and in harmony without any perceptible bumps or abrupt speed variations in any axis. A team of four needed to coordinate their pacing and communicate in silence (so as not to ruin the sound operator's good work).

The shearing shed

When the flock finally arrived back at the farm, there was a real sense of relief as they poured into the sheep pens and Andrew closed the gate, the conclusion of an epic journey down the mountain. There was a similar sense of relief as all the drone units and support staff gradually arrived back in dribs and drabs. Despite the challenging conditions on the summits they were all relatively unscathed (apart from the odd blister). There was just enough time for a well-deserved lunch break before a rapid turnaround to prepare to shoot the culmination of the gather: the sheep shearing.

Matching the visual grammar established by the almost hypnotic drone photography inside a relatively small shearing shed was the next technical challenge. The solution: an URSA Mini Pro on a Ronin gimbal, mounted on a jib arm, mounted on a Twister dolly, on tracks – what could possibly go wrong?

Lots. Luckily, DoP John Livesey is renowned for his problem-solving wizardry, and Andrew had a few hundred sheep to shear, providing plenty of opportunities for retakes: *"The real issue on the day was mechanical, rather than digital, in nature. Achieving fluid, languorous shots in a tight space meant moving the dolly, jib and Ronin all exceptionally slowly and in harmony without any perceptible bumps or abrupt speed variations in any axis. A team of four needed to coordinate their pacing and communicate in silence (so as not to ruin the sound operator's good work); Tania Barychka was pushing the dolly, Will Moore operating the gimbal remote, I was swinging the jib and director Johnny was operating the follow-focus. We were taking our cues from the shepherd and indeed the sheep, as we endeavoured to keep the animals as calm as possible before they were pulled out for shearing; having a large piece of foreign equipment lean in close from above was likely not to please them. Thankfully, with very slow, smooth camera movements, plenty of sweating brows and the calm, practised hand of the shepherd, we got a bundle of good shots.*

"After the jib and gimbal shots, we squeezed in a few more using just a tripod head on the bazooka of the dolly: tight, long lens shots on the end of the Canon 70–200mm from about 1.5m away. Slowly dollying in and out and pan/tilting around for details of the shearing; you can get a real sense for just how densely packed a sheep's coat is when seen at this range; once sheared off, the wool remains bound together like a 6-inch thick mat. Also, a personal observation for which I'm sure sheep enthusiasts will lambast me, the shape of a sheep's iris is quite spooky when seen in close-up!"

From shearing shed to cutting room

One of the hardest jobs in the offline was finding appropriate points to jump between the two shoot days – the weather was noticeably worse on the second day. Editor Paul Shepard (yes, that is his real name!) used points in the footage where the cameras were tilted down, as it was usually the horizon and peaks of the mountains that gave the game away.

I was happy with our cut, but two days before picture lock the BBC asked to reduce the running time by 10–30 minutes, equivalent to around a fifth of the film. In any other production this would have been devastating, but Paul managed to make the necessary trims in a morning, largely thanks to the long sections between the poetry and interview. In the final

BBC/WINDFALL FILMS

Back on track: once the fog cleared on the lower levels, the drone teams could finally capture the stunning aerial views of the gather they had planned for during the recce

100-minute version, there are just 72 shots, meaning they have an average duration of 1 minute 23 seconds.

Making the grade

In total, the crew used six different types of camera on the shoot. They had mounted two Sony A7 cameras at fixed positions to supplement the drone and GoPro Fusion footage. 'Body cam' shots are always going to stick out, as much due to their angles as the camera's size of sensor, quality of lens and codec. But it was important to try and match all the other cameras as far as possible and John made every effort to ensure this: *"The decision was made to shoot in ProRes rather than Blackmagic RAW; this provided a comfortable bitrate and footage easily capable of matching the surrounding drone footage, plus it eased the fears for folks further down the pipeline not yet keen on the relatively new BRAW codec (although this DoP swears it's excellent!). We knew the 15-stop dynamic range of the camera would need only a little grading-down in post to cut in with the approximately 13 stops the majority of the drone cameras use."*

The footage from all the cameras graded and matched well; the colourist didn't have any issues, even for the 4K international distribution version. The mix spanned a gruelling three weeks, including five days of foley work, but with no music and only short sections of interview and poetry to 'hide behind', it was absolutely essential.

BBC Four broadcast the film on Easter Monday, just a few weeks into the pandemic lockdown. COVID-19 didn't exist when the project was commissioned but for the viewers who tuned in, it provided an opportunity to escape and enjoy the spectacular setting as they witnessed a bird's eye (and sheep's eye!) view of this timeless event. In the 21st century, when the world seems to be moving in fast forward, hopefully the film will remind viewers that sometimes less is more.

Fact File

Johnny Shipley has worked at Windfall for almost a decade, producing content for major broadcasters in both the UK and US. He has been a CAA-approved UAV pilot since 2016 and has a passion for using the latest technology to create more immersive, engaging storytelling in documentaries.

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DoP **John Livesey**'s series credits include UKTV's *Expedition with Steve Backshall*, Discovery's *Gold Rush: Parker's Trail*, BBC's *Top Gear* and Channel 4's *Mutiny*.

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Mark Stokes and **Nik Porter**'s credits (through their company FLOTTI) include C4's *Devon and Cornwall*, BBC's *Panorama*, Netflix's *Jack Whitehall: Travels with my Father* and MTV's *Teen Mom UK*.

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Kirk Watson has filmed for ITV, BBC, National Geographic, NHK Japan, BBC ALBA, Discovery Channel and several feature films including *Redwood Massacre* (2019) and *Godzilla: King of Monsters* (2019)

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