



Post - Project Report for professional exchange visit to Working on Fire (WoF) South Africa - July 2014

Group Commander Randy McComb – NIFRS



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1. INTRODUCTION

In July 2014 I had the privilege of participating in a professional exchange to South Africa's Working on Fire Programme WoF. This exchange was organised jointly between the [FRISK GO](#) project, WoF South Africa and WoF Europe, the Pau Costa Foundation and the UK Wildfire Group. I was initially made aware of this programme by Steve Gibson (Northumberland Fire and Rescue Service) who had previously taken part and recommended that I should attend.

I am the Lead Officer for Wildfire in the Northern Ireland Fire and Rescue Service (NIFRS) and sit on the UK Chief Fire Officers Association (CFOA) Wildfire Forum and it was through this forum that the opportunity to visit South Africa became available.

2. BACKGROUND

Northern Ireland Fire and Rescue Service

Similar to other parts of the United Kingdom (UK) Northern Ireland at certain times of the year experience climatic conditions which can support uncontrollable wildfires. NIFRS refers to these periods as Wildfire spate conditions and although they are not common, when they do occur they can have a severe impact on our service delivery.

In late April early May 2011 a prolonged dry spell with strong easterly winds coincided with two Bank Holidays in Northern Ireland. Arguably this created the 'perfect' conditions for starting and spreading wildfires. Large tracts of upland heath and moorland in Antrim, the Mourne Mountains, Fermanagh and the Sperrins were burnt, as were similar areas in Donegal, Sligo and Mayo in the Republic of Ireland.

NIFRS reported that it attended to over 3,000 wildfires in the first six months of 2011 and, during the critical period between 15 April and 4 May, responded to 1,977 reports of gorse/heath fires. It estimated that the cost to the Service of attending these fires was £8 million. At one stage during the Bank Holiday in May NIFRS were receiving a call every 45 seconds, the busiest period in its history.

During these hot and dry periods, large areas of semi-natural vegetation, forests and other assets in rural areas have the potential to be burnt. The fuel load hazard is increasing in some areas, both in terms of fuel quantity and the continuity of fuels.

This is due to reductions in agricultural and increases in the area of native woodlands. The outcome is that, when fires occur, fire intensities are higher. High intensity fires are much more difficult, dangerous and expensive to extinguish and do more damage to the environment.

NIFRS currently does not conduct prescribed burns nor does it employ offensive burning as a fire suppression tool. Like other FRS in the UK its traditional approach in dealing with wildfires has been to employ direct attack methods using water (if available) and/or fire beaters, the other tool fire and rescue services tend to rely upon can only effectively cope with low intensity fires (flame height <1.2M). This method of dealing with wildfires can increase risks to firefighters and be also resource intensive and as a consequence of this NIFRS is keen to explore and develop more effective methods to deal with wildfires in the operational environment.

The introduction of a Specialist Wildfire Officer integrated within the Incident Command System to provide tactical advice to the Incident Commander was one of the first steps NIFRS took to address their wildfire operational response. NIFRS Officers attend a week long course facilitated by Northumberland FRS and receive enhanced Wildfire training in a number of key areas including;

Wildfire prediction system

Wildfire fire behaviour

LACES

Navigational skills

Fuels

Meteorology

As an organisation NIFRS have recognised that it must develop a more forward thinking cohesive strategy in collaboration with other key stakeholders if it is to reduce the number of wildfires and the impact they have on the environment and the community.

The opportunity to attend the knowledge exchange study trip to South Africa and enhance my knowledge, skills and understanding of wildfire management, behaviour and response will be of great assistance in exploring and developing the future strategic direction of the NIFRS alongside our partner organisations.

Working on Fire South Africa

Working on Fire (WoF) is a Government-supported programme, formed in 2003 to develop an integrated national fire prevention and wild fire fighting capacity.

WoF includes a job creation component with firefighters being recruited from marginalized communities and put through extensive training programmes equipping them to become skilled veld and forest fire fighters. WoF makes available aerial firefighting resources, training, awareness education and incident command capacity to its partners as well as co-ordination of firefighting resources through dispatch centres placed strategically in fire prone areas.

WoF supplies fire fighting services to the Forestry Industry in South Africa, the KZN Provincial Department of Agriculture and Environment, South African National Parks, Ezemvelo KZN Wildlife, Cape Nature, Mpumalanga Parks Board, Fire Protection Associations, municipalities and various other organizations, and is available as a national firefighting resource in the event of a disaster or potential disaster. Over 250 firebases each home to a 22 person firefighting crew, selected from formerly unemployed people and trained by WOF, have been established throughout South Africa. Through the National Disaster Management Centre, WoF supplies helicopters and fixed wing spotter aircraft to supplement local aerial firefighting efforts.

The programme was established under the umbrella of the Expanded Public Works Programme (EPWP) underpinned by the National Veld and Forest Act of 1998 and the Disaster Management Act of 2002. (sourced: you, wildfires and the law, 2014)

3. STUDY PROGRAMME

The following is a breakdown on the forest fire study tour and practical training activities that I undertook in South Africa during July 2014.

1. Attended a prescribed burn in a difficult area burning old dry reeds.

Project manager Ernst Brewer from WoF was leading a team of 16 WoF firefighters at the site of the prescribed burn. The burn area was a long narrow area of approximately 10 hectares of dry reeds in between two commercial forests. His resources included two Baccy Saccys (South African slang for pick-up trucks with pumps) back-packs, fire beaters and rakes. The burn proved to be very difficult to plan due to the topographical winds which from the high to the low point changed direction several times. Ernst had to continually assess and re-assess his tactics and was constantly monitoring and observing the conditions using both a Kestrel and information provided to him from his team. During the entire burn Ernst continuously drove and walked the entire site. This reinforced to me the need to keep vigilant at all times for any signs of spotting or changes in wind conditions. Ernst explained to me the importance of the pre-planning with the landowner including identifying the areas which needed controlled and the control lines which needed to be cleared prior to WoF arrival. This became evident when we were navigating around one particular site and came across a tree stump which had not been removed. Ernst then had to take this into consideration when devising his burn plan and positioning of his teams and their escape routes if required. The team concluded the burn with the mopping up exercise. Mopping up is carried out around the full perimeter of the burn site to a depth of 5 metres. The firefighters damp the area down with water from their backpacks, beat out any areas of smouldering with the beaters and then rake the ground down to bare mineral earth. Water is applied to tree stumps mainly using hose reels from the Baccy Saccys. Once completed the team then retire to their camp site where one member of the team had remained to prepare the dinner for the returning crews. This is another additional responsibility of the project manager Ernst to ensure the teams have adequate food supplies available.



2. Met with the FPO (Fire Protection Officer) of Mpumalanga Umbrella Fire Protection Association who briefed on Aerial Support, FDI's (Fire Danger Index) and FPA's (Fire Protection Associations), integrating land users through the establishment of multi-stakeholder .

Trevor Wilson (Provincial FPA) provided me with a comprehensive breakdown on the roles and responsibilities of the WoF Aerial response assets which includes.

Spotter planes and pilots

The spotter planes most commonly used by WoF are single engine Cessna's. The plane and pilot carry out a number of different functions at a Wildfire. They are the 'eyes in the sky' for the land manager (incident commanders) on the ground referred to as the 'fire boss'. The spotter pilot also coordinates the fire bombers and helicopters by directing them to their drop targets. The spotter also can map the fires and keep a lookout for other fires which have maybe not been detected by personnel on the ground.



Fire bombers

The fire bombers single role is to deliver several thousand litres of water or gel to a fireline very quickly. They are most effective on initial attack when the fire is small. Although they are less effective at larger fires they can still be used for spot fires and protection of property. They are fixed wing aircraft and the most commonly used bombers are crop-spraying aircraft.



Helicopters

The most commonly used helicopters are the Bell 205 and 206. The helicopters are the most versatile aerial asset and can carry out a number of functions including:

Spotter role.

Transporting strike team personnel and equipment.

Dropping water/suppressants.

Medical evacuation.

Fire mapping and reconnaissance.

The helicopters are fitted with a 'bambi' bucket suspended by cables from the cargo hook. The buckets can have a capacity of 3000 litres.

Helicopter strike teams

WoF have dedicated helicopter crews who are highly trained and experienced. These crews are highly skilled at using hand tools supported by water drops from the helicopter. The helicopter teams are recognised as the elite firefighting personnel within WoF and competition for places is very high.



Safety

Trevor highlighted to me that his primary role as a spotter pilot is air operations safety. He explained to me that this is achieved through communications and coordination of the air and ground crews. The aerial assets work at different altitudes with the helicopters at the lowest level followed by the firebombers above them and then the spotters at the highest level. Communications between the air and the ground is only between the spotter pilot and the fire boss. Only the spotter pilot communicates with the helicopters and bombers.

Limitations

Aerial operations can be limited due to a number of factors including:

The turnaround time due to the time it takes and the distance from the drop area to the fill-up point, wind conditions, time of day, hazards such as power lines, trees, dense smoke etc.

Fire Danger Rating system

Trevor explained to me how the Fire Danger Rating (FDRI) system works and demonstrated this with the use of a chart. The FDR system rates the fire danger on any given day in a particular region, given a particular set of circumstances.

Fire Protection Association

Trevor provided me with an overview of how the Fire Protection Association functions and acknowledged the benefits of a multi-agency approach in both prevention and intervention.

It became apparent during my discussions with Trevor the aerial support crews not only require extreme proficiency in the operation of the aircraft but equally require a high level of knowledge and understanding in fire behaviour, fire tactics and incident command. Specifically the role the spotter pilot plays is a key element to the successful conclusion of any incident. I was so impressed again by the wealth of knowledge and experience that Trevor has of dealing with wildfires which he so enthusiastically shared with me.

3. Flew in a spotter plane at a fire where they had aerial support and witnessed the actual co-ordination work of the spotter.

After completing the necessary paperwork mid afternoon I had the fantastic opportunity to accompany pilot Mike Assad on board his spotter plane to an incident approximately 30 mins north of the base. I had the enviable task of seeing at first hand an air operation in action. This was a forest fire spreading to approximately 50 hectares with a fire front of approx. 2-3 kms. When we arrived at the location two helicopters had already begun making drops. Mike had to initially make contact with the fire boss to ascertain his fire suppression operation strategy and objectives. Communications proved to be difficult as there appeared to be a lot of radio traffic on the ground so after a number of communications with the fire boss and traffic control another dedicated radio channel was agreed. Mike continued circling above the fire and began directing the helicopters to make drops at certain points along the fireline. Mike continued to liaise with the fire boss and between them they identified a water source for the helicopters. The helicopters made some progress with controlling the fire however due to a requirement to return to base before sunset Mike had to call a

cease to the air operations. . At times due to the heavy smoke and other factors the plane struggled at times to gain altitude above the fire. The situational awareness gained from the spotters perspective as to what is actually happening on the ground was invaluable, I came away with a fuller understanding and appreciation of the dangers of wildfire to responding ground crews and the immense added value an aerial view can bring.



NIFRS does not employ aerial assets as part of a suppression strategy at wildfires. NIFRS however has a Memorandum of Understanding with Skywatch Civil Air Patrol who can provide aerial reconnaissance to NIFRS Incident Commander at wildfires incidents. My experience with WoF has highlighted to me how beneficial aerial support can be at the early stages of an incident especially when applying water to mitigate fire spread. This is a potential area for further exploration by NIFRS.

4. Visited the National WoF Training academy and got an overview of WoF training courses and fitness requirements.

I was taken a tour of the WoF academy by the training centre manager and was immediately impressed by how professionally well managed the centre is. The academy's holistic approach to developing the firefighters not only in firefighting but in other life skills was delightful to observe. The ethos of the academy is about socially uplifting the young people and providing them with the opportunities and skills to develop themselves in a number of different areas including construction, landscaping and catering. I saw recruit firefighters undertaking marching drills, physical training activities and finally a demonstration of wildfire firefighting suppression techniques. I was informed that all firefighters both during and after training must undertake a weekly fitness test which includes a timed run, 40 press-

ups, 40 sit-ups and 10 chin-ups all to be completed within a certain time frame. The enthusiasm from both the firefighters and the centre staff was infectious, the firefighters were immaculate and the centre was spotless despite the dry, and dusty conditions. The pride shown by everyone I met in the fire academy was obvious to see and was suitably justified.

An incident command course for landowners/managers was also being conducted by WoF whilst I was there. This also reinforced to me the need to have a fully integrated approach when dealing with wildfires and there are elements to this which I intend to develop as part of a NIFRS wildfire project.



5. Met with National Coordination and Dispatch who presented on Dispatch and Co ordination of ground and aerial resources across the country and interagency work with police, army, private contractors and land owners like forestry.

Lizzette Heine (National Fire Coordination and Dispatch) provided me with a very detailed and informative insight in to the operation of the National Coordination and Dispatch operations. Lizzette described how it has developed and expanded from its initial inception of one individual to its current national network. Lizzette provided me with an overview of the training involved for dispatchers and the assurance processes that are in place. I was also given an overview of the

interagency work and the challenges that this entails. I also had the opportunity to visit to two dispatch centres one in Grasskop and the other in Nelspruit, where I was able to witness a dispatcher dealing with an incident and mobilising aerial assets to same. Lyzzette's vast comprehension at both operational and strategic levels and attention to detail was remarkable.



6. Visited Grasskop area and met with FPO of Grasskop FPA who presented on what he does in the wildland/urban interface and showed the extensive burns he has done in the Grasskop area to protect the local community. It is impressive what Grasskop FPA has achieved with the limited resources available.

I spent the day with Sakki Van der Merwe the FPO at Grasskop and his son also a firefighter and had one of the most memorable days of my visit. Sakki and his son showed me around their station and their equipment and enlightened me on the extreme challenges they have in delivering a fire and rescue service to the community of Grasskop. We toured the entire town and Sakki spent considerable time showing me the rural urban wildland interface risk areas within the town and the large prescribed burn areas undertaken by WoF to mitigate the risks. Sakki shared with me his experiences and the lessons learned of the major wildfire of 2009 which caused several fatalities and major destruction of the area. Sakki showed me the orphanage and the vegetable patch which his firefighters tend to every week. Sakki's commitment to the community, his pride in his job and his genuine respect for his firefighters was inspirational to me and he taught me so much in such a short period of time.



7. Visited various sites to see results of fuel reduction in grasslands and Under Story Burning in commercial forestry plantations..

Bob Connolly Project Manager Co-ordinator for WoF had been given the task of hosting me and organising my activities during the trip. Bob proved to be a wealth of knowledge and experience which he shared with me with such passion and interest. He provided me with an extremely interesting and informed overview of WoF specifically surrounding the research and development work that was currently being undertaken. This included a visit to a trial understory burn area in a commercial forestry plantation. Bob explained to me the ecological benefits of understory burning and showed me how this can also encourage the growth of new species of plants. He also explained to me how and when to carry out this type of burning in a controlled and effective manner. Bob showed me examples of different fuels and explained how they behave differently under fire conditions.

7 . SUMMARY

If I was to sum up in three words my experiences in South Africa it would be professionalism, passion and generosity. The people I met, the time afforded to me and the wealth of knowledge and experience of wildfire and the ecology both overwhelmed and humbled me. I arrived in South Africa with very little or any real knowledge of wildfires compared to my peers in Working on Fire (WOF) and in a very short but intensive period of time I came away with a whole different perspective on how wildfires could or should be managed.

The trip has highlighted to me in particular the need for Northern Ireland to establish a network of fire groups comprising of the relevant stakeholders to encourage a sharing of responsibilities between land managers and the fire service. As well as providing a “pre-incident” liaison arrangement (in which all stakeholders can work together and develop mutual understanding), the fire groups help to create a framework for fire service and land management resources to be brought together at incidents.

I have learned that Northern Ireland must bring together the knowledge and responsibilities of NIFRS, land management sectors and ecologists. This is because:

- Due to the relative infrequency of wildfires in comparison to urban incidents, NIFRS and land managers suffer from a lack of regular experience in jointly responding to these incidents.
- NIFRS is responsible for extinguishing fires and are highly trained to respond to a wide range of incidents. Recently there has been considerable investment in training and equipment to ensure a professional response to wildfire incidents. However, this is a relatively recent phenomenon and as such our relative lack of wildfires experience makes us vulnerable.
- Landowners and managers have no statutory responsibility for providing preparedness and prevention measures. They require increased awareness and guidance to reduce the severity and likelihood of wildfires, and enable effective communications with the NIFRS.
- Provision of controlled burning training to reduce costs of the impact of wildfires.
- Landowners and managers and NIFRS have no framework for joint working. This is a critical hurdle restricting the effectiveness of response to wildfire incidents.
- Incidents require specialised equipment to extinguish wildfires. This equipment exists but we need to identify owners and investigate the barriers and solutions to sharing equipment.

- To provide a cost effective approach to wildfires to reduce the financial burden upon landowners, NIFRS, land management agencies, government agencies as well as local communities
- To provide opportunities for regular professional exchange
- To provide easy access to a wildfire community across Europe and the world.

8 CONCLUSION

The trip to South Africa and the exchange of knowledge has been such a beneficial experience and I have learned much more than I had ever expected. I am so impressed with the Working on Fire project not just by the skills and knowledge of those individuals working on the fires and research and development on Veld and Forest fires but also the whole social uplifting ethos which has left me with a feeling of utter admiration for the work the group is undertaking.

I would recommend that WoF continue with this programme as the scale of operations and the opportunity to pass on this vast wealth of expertise I believe is very restricted across the world.

May I thank WoF for providing me with this life changing opportunity which I am very appreciative of. I have made some new friends and fantastic contacts and I will continue to spread my new founded wildfire knowledge and understanding across the UK and Ireland.

I would also like to make special mention to Brick, Chris and Bob, they were all so very generous with their time and made me feel so welcome and special during my entire visit. Finally many thanks to Colleen Sparg for looking after all of my administrative needs.

Without the facilitation of WoF Europe and the FRISK GO Project of the European Forest Institute this exchange would not have materialized. I therefore strongly support the continuation of FRISK GO and the further development of a European Forest Risk Facility FRISK.