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Human dimension of fire: ten years of Minas de Riotinto fire

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Abstract

In 2004 one of the most devastating forest fire started since we have official records and statistics of fire occurrence in Spain. On a fire prone context on July 27, 2004, in Minas de Riotinto (Huelva, Spain) the largest forest fire of the last century and the third largest in the statistical history of Spain initiated. It was extinguished more than three weeks later. The combination of exceptional meteorological, topographic and vegetation conditions resulted a four hours free fire behaviour that burned 4.000 hectares in a 27.000 hectares final perimeter. The economy of the affected settlements and towns was severely damaged not only by the loss of the production of cork, but by the loss of much of its agricultural and livestock production as well as other silvicultural activities, logging and hunting. It was one of the first fires with problems in wildland urban interfaces at large scale because of more than 1000 people evacuated from their homes. Inside this fire prone area, one of the most affected places was the small town of Berrocal which saw how more than 90% of the territory in the municipality was seriously affected by fire. Also, one of the most active firefighting crews working in the fire belonged to this town.

Keywords: *communities assessment, educational aspects, fire culture, fire emergency, environmental education, emergency evacuation, emergency preparedness, firefighting, fire policy, fire prone areas, fire risk, forest fires, hazard, how to prevent, human behavior, prevention, risk, safety, wildland urban interface, wildland urban interface fire hazards.*

1. Introduction

In 2004 one of the most devastating forest fires started since we have official records and statistics of fire occurrence in Spain. On a fire prone context on July 27, 2004, in Minas de Riotinto (Huelva, Spain) the largest forest fire of the last century and the third largest in the statistical history of Spain initiated. It was extinguished more than three weeks later. The combination of exceptional meteorological, topographic and vegetation conditions resulted a four hours free fire behaviour that burned 4.000 hectares in a 27.000 hectares final perimeter. More than 1.000 people were evacuated from the towns of Berrocal, Escacena del Campo, Minas de Riotinto, Nerva, Paterna del Campo y Zalamea la Real (Huelva province) and from Aznlacóllar, El Castillo de las Guardas, El Garrobo, Gerena y El Madroño (Seville province). The economy of the affected settlements and towns was severely damaged not only by the loss of the production of cork, but by the loss of much of its agricultural and livestock production as well as other silvicultural activities, logging and hunting.

The catastrophic fire among other material and human damage caused the death of two citizens disoriented by the smoke in the interior of his car. They tried to run out but they were achieved by fire. Some horus later the pilot of one of the extinction helicopters was seriously injured during the approximation maneuvers to take water.

The Minas de Riotinto Fire was one of the first wildland fires with serious problems in wildland urban interfaces at large scale because of more than 1000 people evacuated from their homes. Inside this fire prone area one of the most affected places was the small town of Berrocal. This area saw how more than 90% of the territory in the municipality was seriously affected by fire. Also, one of the most active firefighting crews working in the fire belonged to Berrocal.

2. Methods

The present paper researches through personal interviews and analyzes the situation of these people, firefighters (brigade members) and citizens, in 2014, ten years after the fire.

The study work was intended to extract information in order to try to understand one of the most overlooked realities within the human dimension of fire as it is the condition of people who have suffered these losses. A series of interviews was conducted in Berrocal (Huelva, Spain), a 300 habitants towns, with key actors related to the process. It took place at the beginning of 2013.

During the interviews to 25 people (1 wildland firefighting technician, 5 firefighters, 1 mayor and 13 civilians), the goal was to know to the persons affected directly by 2004 fire or not directly affected by suffering the effects ten years later. Among other things, the interviews touched on the so-called message of natural resources but also childhood at Berrocal, memories and future plans. Interviewed were treated sensitively in the interviews, taking into account their serious suffering from the event and even trauma (some cases).

Most of older people in Berrocal were older than 70 years old in 2004 (80 years old in 2014). At this study time there was a part of the population aged below 40 years and other part below 13-15 years.

3. Results and discussions

Many of citizens of Berrocal feel completely abandoned by regional institutions. The view shared by the majority of participants was indifference from the point of view of refusing to discuss the fire topic (again).

Some of the interviewed belonging to the elder group have not preserved a clear memory of this past situation.

Because they were too young in 2004 the members of the 13-18 years old didn't have memories of those unforgettable days from almost the rest of the population.

4. Conclusions

This fire events permitted an effective learning from past wildland fire incidents and important safety lessons. Also permitted a large number of lesson learned from wildland fire incidents from the point of view of managers. However, the human part not belonging to firefighting services felt abandoned a few years after the fire.

The media have contributed in some cases to create a growing excess of pressure in the population during the first years focusing on the past not their present even their future.

It seem not to be clear for civilians the human factors in wildland fire safety, including impact of legal and institutional responses on wildland fire.

5. References

- Absher, J.; Kyle, G. 2007. An overview of risk and trust as precursors to defensible space actions by wildland-urban interface residents.
- Allen, J.B.; Ferrand, J. 1999. Environmental locus of control, sympathy, and proenvironmental behaviour: a test of Geller's actively caring hypothesis. *Environment and Behavior*, 31(3): 338–353.
- Caballero, D.; Quesada-Fernández, C. 2011. Caracterización del riesgo por incendio forestal en la interfaz urbano-forestal en la Comunidad Autónoma de Andalucía - Zona costera de Málaga y Granada. Junta de Andalucía, Consejería de Medio Ambiente. Spain.

- Caballero D., Quesada C. 2011. Evacuation, shelter in place, forced confinement or run-away? The reality of fire situations in the WUI in Europe in Proceedings of the ICFBR 2011 International Conference on Fire Behaviour and Risk. Alghero, Italy - October 4-6, 2011. pp 49.
- Cvetkovich, G.T.; Winter, P.L. 2008. The experience of community residents in a fire-prone ecosystem: a case study of the San Bernardino National Forest. Res. Pap. PSW-RP-257. Albany, CA: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture.
- Kollmuss, A.; Agyeman, J. 2002. Mind the Gap: why do people act environmentally and what are the barriers to pro-environmental behavior? *Environmental Education Research*, 8 (3).
- Molina-García, Y. 2006. La participación comunitaria en la prevención y combate de incendios forestales: estrategias que la promueven. *Revista For. Lat* 40:107-123.
- Mueller, J.M.; Loomis, J.B.; González-Cabán, A. 2008. Do repeated wildfires change homebuyers' demand for homes in high- risk areas? A hedonic analysis of the short and long-term effects of repeated wildfires on house prices in southern California.
- Rodríguez-Trejo, D. A.; Rodríguez-Aguilar, M.; Fernández-Sánchez, F. 2001. Educación e incendios forestales. Mundi Prensa. Madrid.
- Quesada-Fernández, C. 2007. Simuladores de incendios forestales como respuesta al incendio de Minas Riotinto (Huelva, España) el 27 de julio de 2004 in Proceedings of the IV International Wildland Fire Conference, Sevilla, Spain. 2007.
- Quesada-Fernández, C.; Quesada-Fernández, D. 2011. Improving educational aspects as a way to prevent fire risk in fire prone communities in Spain. In Duce, P.; Spano, D. Proceedings of the ICFBR 2011, International Conference on Fire Behaviour and Risk. Alghero. Italy. EDES Sassari. Italy.
- Quesada-Fernández, C.; Quesada-Fernández, D. 2012. Improving educational aspects as a way to prevent fire risk in fire prone communities. Cases of study in Spain. In: Spano, D.; Bacciu, V.; Salis, M.; Sirca, C. Modelling fire behaviour and risk. Sassari. 218-223.
- Quesada-Fernández, C.; Quesada-Fernández, D. 2013. Fire risk perception in small fire prone communities. Study cases in Proceedings of the International Conference on Forest Fire Risk Modelling and Mapping. "Vulnerability to forest fire at wildland-urban interfaces". Aix en Provence, France, 30 September-2 October 2013.
- Vélez, R. 2000. Actuación sobre las causas de origen humano. Persuasión, conciliación y sanción. Legislación preventiva. In: Vélez, R. (coord.). La defensa contra incendios forestales. Fundamentos y experiencias. McGraw-Hill, Madrid. 13.1-13.6 y 13.18– 13.28.
- Vélez, R. 2002. Forest fire prevention with a target: The rural people. In: Viegas, D, editor. Proceedings of the IV International Conference on Forest Fire Research. Luso, Portugal.
- Vélez, R. 2007. Experiences in Spain of community based fire management. In: Proceedings of the IV International Wildland Fire Conference, Sevilla, 2007.
- Vélez, R. 2008. Forest Fires in the Mediterranean Basin. In: González-Cabán, A, coordinator. Proceedings of the III Symposium on Fire Economics. Carolina, Puerto Rico, 2008.
- Villalba Ondurria, D.; Martín Pinto, P. 2004. La educación como herramienta fundamental en la prevención de incendios forestales. *Tabanque*, 18. 189-206.