



**ADVANCES IN  
FOREST FIRE  
RESEARCH**

**DOMINGOS XAVIER VIEGAS**

**EDITOR**

**2014**

## Safety at the WUI: a firefighters view

Clara Quesada-Fernández<sup>a</sup>, Daniel Quesada-Fernández<sup>b</sup>

<sup>a</sup> *Universidad de Córdoba, Spain. [claraquesada@gmail.com](mailto:claraquesada@gmail.com), [danielquesadafernandez@gmail.com](mailto:danielquesadafernandez@gmail.com)*

### Abstract

Firefighting is a risky task. Every year during an even longer fire season we attend to many injuries and fatalities of civilians and firefighters in the frame of forest fires activities, especially in wildland urban interface fires situations. Every fatality and injury are investigated, in most of cases they are object of scientific research in order to learn from mistakes. Extracting the learned lessons helps to try not to repeat the situation. In case of recurrent risks personnel can be prepared to deal with them safely. Research in materials, procedures, protocols and many others, most of them are measurable aspects. State and regional agencies invest resources in education and training of its personnel in fire situations. However, in some cases it is not assessed enough those involved (firefighters) on their own identification and perception of risks.

**Keywords:** *communities, fire emergency, emergency evacuation, emergency preparedness, firefighting, fire prone areas, fire risk, forest fires, hazard, how to prevent, human behavior, personnel safety, prevention, risk, safety, wildland urban interface fire hazards.*

### 1. Introduction

Firefighting is a risky task. Every year during an even longer fire season we attend to many injuries and fatalities of civilians and firefighters in the frame of forest fires activities, especially in wildland urban interface fires situations. Every fatality and injury are investigated, in most of cases they are object of scientific research in order to learn from mistakes. Extracting the learned lessons helps to try not to repeat the situation. In case of recurrent risks personnel can be prepared to deal with them safely. Research in materials, procedures, protocols and many others, most of them are measurable aspects. State and regional agencies invest resources in education and training of its personnel in fire situations. However, in some cases it is not assessed enough those involved (firefighters) on their own identification and perception of risks.

Sometimes an excess of confidence or a lack of it due to a misperception of risk involve the occurrence of an accident. They are very little analyzed the so-called almost accidents. This situation is particularly relevant in wildland/rural urban interface areas.

### 2. Methods

The current situation about safety risks in the firefighting tasks shows identified risks and other unknown or not identified as risks. It is discussed the risk perception/vision of firefighters fronting fires in wildland urban interface areas.

The study examines the case of several working groups. In particular we study cases in Spain, located in different areas of the territory (peninsular, islands) with different working protocols to fighting fires in the WUI areas as common work situation to all of them. We show the analysis of different Fire Services situations all of them in fire prone areas through the view of their firefighters.

Collected data were obtained from a 151 firefighters sample in Spain from base to higher levels in the firefighting scale. They collaborated in a extended survey during six months. In some of the cases firefighters had a specialized work in forest fires, following a Forest Model. In others cases existed a structural fire-based Service fronting forest fires.

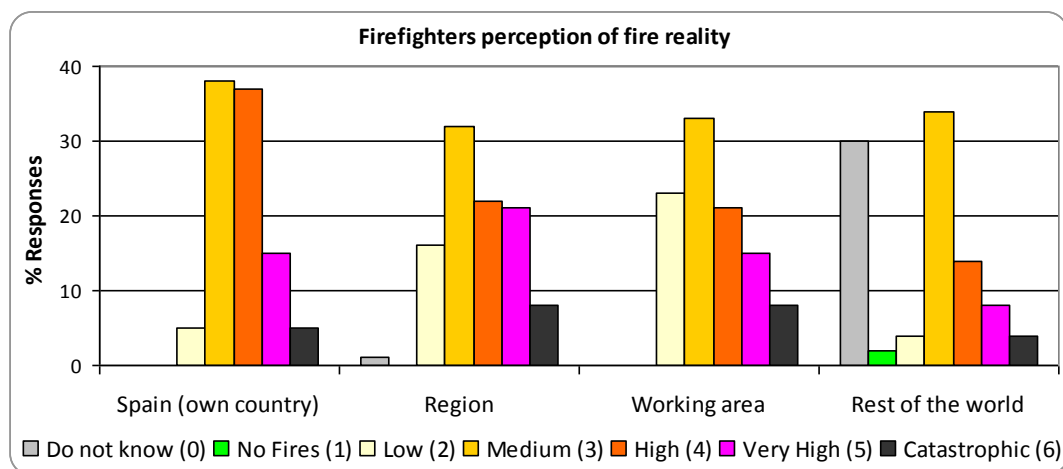
The process consisted of a survey containing 50 questions about risk perception in firefighting tasks at the WUI. Each thematic block in which was divided the survey was presented with some introductory comments that summarized the contents. The first section of topics was dedicated to recognising the

main activity of firefighters at their Service structure, experience in fighting fires, personal data (sex, age). The second part followed knowledge on the topic of forest fires from the perspective of fire management, fire fighting, wildland urban interface and the state of the art in their territories and others places. We asked about the perception of risk levels and existence of additional types and risks levels working at forest areas and wui areas. The third part analyzed the perception of human relations between professionals and citizens. The last section was dedicated to a miscelanea of questions about the perception of firefighting future at the WUI.

### 3. Results and discussions

The first section dedicated to recognising the main activity of firefighters showed 151 firefighters (141 men, 10 women) working on preventing and fighting forest fires (97% of them, 3% only prevention tasks) with more of ten years of activity. They described their activity as interesting (35%), usefull (33%) and risky (28%) and by calling as firefighting (70%). A minimum of 4% considered the activities as no risky tasks.

The second part followed knowledge on the topic of forest fires from the perspective of fire management, firefighting, wildland urban interface and the state of the art in their territories and others places. It was carried out using a four-level grid consisting of progressive steps of assessment from level 1 (no fires) to level 6 (catastrophic). The Do not know (Dk) answer was also available. As shown in *Figure 1* the most popular argument tended to be referred to levels 3 (medium) to 6 (catastrophic) in the own country (Spain, 94% of data collected), the region (82%), working areas supposed to be well known (77%) and other places in the world (32% of referred data “Do not know” and 62% referred to levels 3 to 6).



*Figure 1. Perception of fire reality. Source: Quesada, C. & Quesada, D., 2014.*

We asked about the perception of risk levels and existence of additional types and risks levels working on fires in forest areas and WUI areas in Spain. To the question “Special risk at wui firefighting tasks” a number of 18% answered that the risks at the WUI were exactly the same as those on fighting forest fires. It is pretty clear to them the number of additional risks as seen in *Figure 2*.

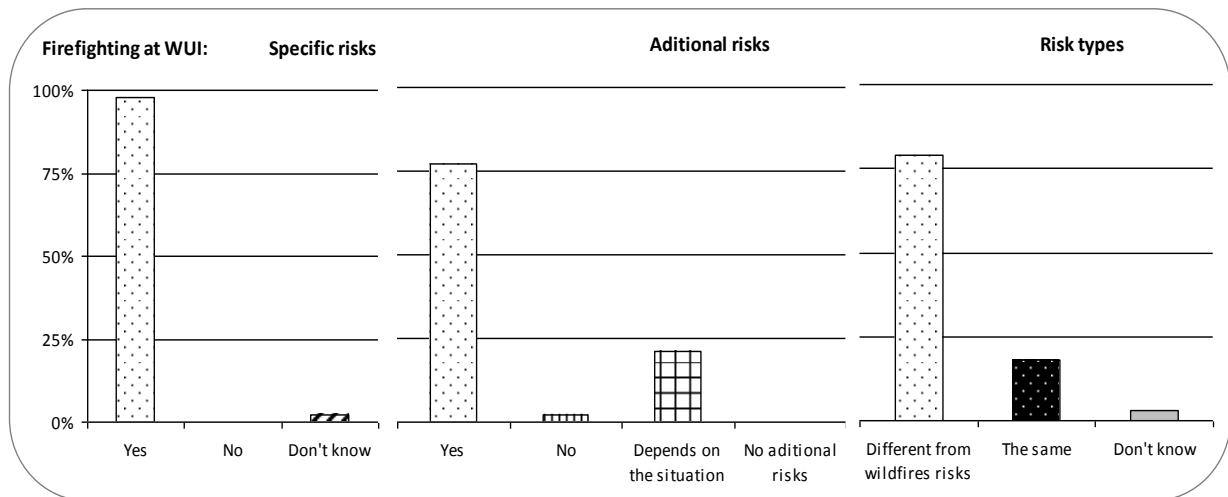


Figure 2. Perception of firefighting risks at WUI. Source: Quesada, C. & Quesada, D., 2014.

The third part analyzed the perception of human relations between professionals and citizens. A number of 28% admitted that they ignored if civilians (residents, owners, tourists) had been previously informed about prevention and fighting policies and activities at WUI areas. More than 30% of professionals perceived that civilians didn't know about firefighting tasks neither who were the professionals responsible for that. If they did (firefighters fight forest fires and WUI fires) they didn't recognize their work as relevant or even consider that as an important task. This fact was specially relevant at WUI and rural areas.

Asking about WUI areas a number of 11% didn't know what WUI meant. This data corresponded to those professionals working in forest areas with an inexistent participation in fires in those areas. However, most of firefighters have expressed their lack of knowledge and how to proceed in a WUI fire. Referring to firefighting strategies and tactics at WUI areas a high number answered about an inappropriate situation in terms of not specific tools with their actual PPE (37%), hand tools (26%), trucks, engines or vehicles on the road (25%) and a general lack of efficiency (41%).

The last section was dedicated to a miscelanea of questions about the perception of firefighting future at the WUI. More than 69% of professionals answered they didn't feel recognised in their work by superiors into the organizational structure.

#### 4. Conclusions

It would be reasonable to think that a 4% of participants considering the firefighting activities as no risky tasks is a difficult situation even with a low percentage. The special risk at wui firefighting tasks, with a number of 18% answering exactly the same risks as those on fighting forest fires, it is understandable from the point of view of personal safety and related risks of this type of activity.

The situation in nearest places (provinces, regions, own country) is perceived as worse than in the rest of the territories (other countries, other regions, rest of the world). This perception is not necessary related to real situation is some cases. Some example cases as australian (Victoria State) and north and south american fire seasons (USA, Canada, Chile) are not seen as specially relevant situation from the point of view of fires and related events by an important part on the participants in this study.

It should be necessary to facilitate more oportunities to see greater exchange and more numerous examples of collaborative activities between professional and citizens (civilians, owners, residents, tourists) including knowledge and information sharing, research and training in WUI areas assessing wildland fire safety programs and firefighters and public safety in the WUI.

At the same time those professionals working in forested areas need to know that the emergency response services are more and more directed to a global situation (forest areas, civilians, buildings, engines) and not only the forest one that they are used to. These experiences can also contribute to prevent safety lapses, to create a new crew cohesion and wildland firefighter safety. Firefighters can increase feelings as recognised professionals in their work by superiors into the organizational structure.

## 5. Future works

We are now extending the study to other areas of the Mediterranean (France, Greece and Portugal), other Mediterranean climate areas in other latitudes (United States and Australia) and places with similar problems in fighting fires at the WUI (Chile). One interesting fact will study two cases analyzing the situation of a Fire Service confronting the challenges of all fire emergencies (Portugal, France) not only forest fire Services neither those Services mostly specialized in urban and structural fires.

## 6. References

- Quesada, C., Pous, E. 2008. *The Helitransport Brigade Technician: Toward Professionalization of the Sector* in Proceedings of the Third International Symposium on Fire Economics, Planning, and Policy: Common Problems and Approaches. April 29 to May 2, 2008, Carolina, Puerto Rico. Pp 210-225. United States Department of Agriculture Forest Service. Pacific Southwest Research Station, General Technical Report PSW-GTR-227 (English). November 2009.
- Quesada, C., Pous, E. 2009. *¿Hay futuro para el Técnico de Brigada Helitransportada?* in Revista Incendios Forestales, nº 20, april, 2009. Ed. Aifema, Granada.
- Quesada, C.; Quesada, D. 2013. *Firefighters risk perception on firefighting tasks at the WUI* 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.
- TEIE, W. 2005. *Firefighter's Handbook on Wildland Firefighting: Strategy, Tactics and Safety*. 3<sup>rd</sup> edition. Deer Valley Press. California, USA.
- Troup, B. 2013. *The Basics of Firefighter Safety in the Wildland Urban Interface* in Fire Rescue Magazine, march 2013.