



Learning to live with WUI fires

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While fire has been one of the most relevant elements for the advancement of mankind, paradoxically it has also been -and still is- the responsible for major environmental, economic and social problems. Forest fires are probably the clearest example of this paradox. For long episodes of history it has been socially desired and productive but this is no longer the case today. Socioeconomic unbalances together with a scenario of global warming, have given us very severe wildfire seasons, particularly in the Mediterranean, with enormous destructive potential. In addition, fire is approaching wildland-urban-interface (WUI) areas at a faster pace than what it used to do. In a WUI fire, fire-fighters capacities are often exceeded, as they have to respond simultaneously to wildfire suppression, community evacuation and structure protection. The whole WUI fire community has to understand that it's not only fire-fighters' responsibility to protect us against fires. We all have a shared responsibility. Find out what you can do to protect WUI communities and how the Guardian project is facing the challenge!

The global fire paradox

Fire, together with **water**, **air** and **earth** are the four basic elements that explain nature. From among them all, fire is surely the most fascinating, due to its paradigmatic feature of life and destruction. This duality derives from almost 80,000 years ago, when man learned to use fire responsibly and domestically, but since then, its misuse and its involuntary spread have given fire a much-feared danger.

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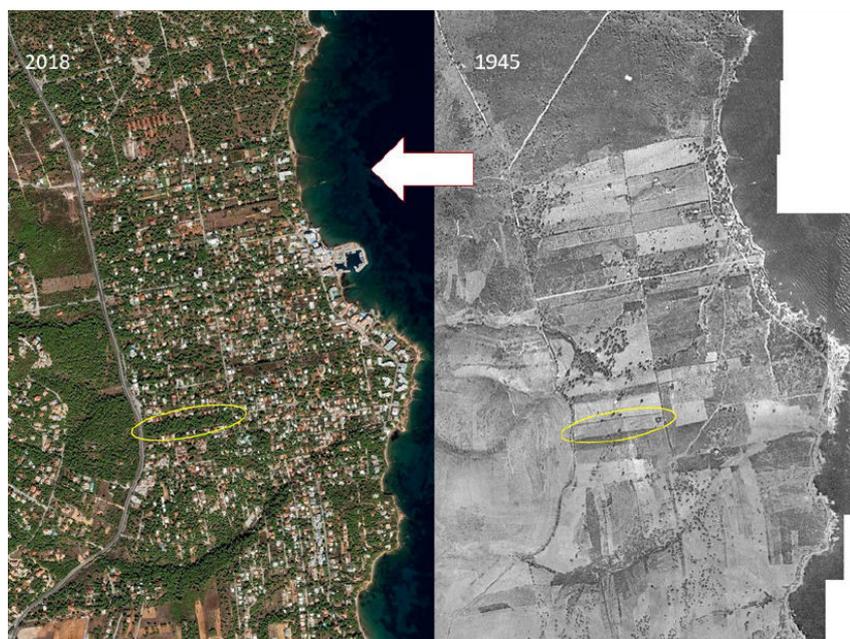
social problems. Fire has several unwanted ways and forms affecting us, being forest, urban and industrial environments the three main scenarios in which fire has a biggest destruction potential.



The global fire paradox. Adapted from Arnaldos et al. (2004)

Forest fires are probably the clearest example of this paradox, as the dimension of the problem they involve is growing together with the degree of development of societies. Fire is part of the metabolism of various ecological systems, and those Mediterranean in particular. For long episodes of history it has been socially desired and productive but this is no longer the case today. There are many causes that are responsible for that, but we could summarize them in three:

- The abandonment of forested and rural areas
- The failure of the primary sector
- The increasing urban demand for forest spaces



Left image: The Mati area in Greece before the devastating fire of July 2018. Highly-populated residential area close to the sea side. Right image: the same area around 70 years before, dominated by crop fields (© David Caballero).

Ferran Dalmau, CEO of Medi XXI the environmental engineering company partner of the GUARDIAN project could not have said it better:

“Every time a livestock farm or a cultivation field that has been producing goods and services for society for centuries is abandoned, the fire approaches the populated areas. The old safety belt (the growing fields) that protected populated areas from wildfires has been unbuckled. Every day we go faster. If no action is taken, you can imagine the outcome.”

These socioeconomic unbalances, together with a scenario of global warming, have given us very **severe wildfire seasons, particularly in the Mediterranean, with enormous destructive potential**. We could mention different fire episodes in Spain (2006, 2017), Portugal (2003, 2005 and 2017), and Greece (2000, 2007 and 2018) occurred during these last years, involving millions of hectares burnt, hundreds of deaths and economic losses of the order of dozens of billions of euros. A short footage describing the helplessness of fire-fighters, politicians and civilians in front of the fire season in autumn 2017 in the Iberian Peninsula can be found in here:

<https://www.youtube.com/watch?v=XP-hllGPp08>

Fires at the Wildland-Urban-Interface, a shared responsibility

Indeed, fire is getting into urban areas at a faster pace than what it used to do, mainly due to climate change and to an increasing sprawl of urban settlements into the forest. **When fire visits the urban interface we talk about Wildland-Urban-Interface (WUI) fires**. WUI fires are one of the most complex fire incidents our society has to tackle, because the complexity of the emergency is just huge. In a WUI fire, fire-fighters capacities are often exceeded, as they have to respond simultaneously to wildfire suppression, community evacuation and structure protection. This is just too much for the majority of fire services! In recent years we are certainly observing how fire is surpassing the technical threshold for effective suppression. Generally, it's not about having more suppression means and personnel but about installing a complete different mindset and strategy to fight WUI fires.

Fire-fighters capacities often exceeded in WUI fires

Wildfire suppression, community evacuation, structure protection!

We have to understand that **it's not only fire-fighters' responsibility to protect us against fires in the interface with urban areas. We all have a shared responsibility**. Public administrations, neighbourhood associations, environmentalist entities, local companies, WUI communities, fire, civil protection and environmental public agencies, fire researchers, fire practitioners, and last but not least, we as individuals living in WUI areas are the ultimate responsible of how we manage our property to mitigate risk in case of an approaching wildfire.

Public and private responsibilities for a collective problem! Now, take a look at the following *Decalogue*, and try to figure out **how you can contribute to mitigate WUI fire risk**. Policy makers, urban and fire practitioners, scientists, and key stake holders (from large organizations to home-owners), we all have a bit (or a lot!) to do:

1. Designing science-based policies and regulations for improved fire management and governance.
2. Planning innovative fire prevention measures, integrating forestry management and fire ecology and promoting circular economy.
3. Raising risk awareness and preparedness of communities and people at risk.
4. Improving predictions of fire propagation and dynamics at the WUI.
5. Increasing knowledge on fire exposure and vulnerability of exposed assets.
6. Developing solid risk analysis methodologies at settlement and property scale.
7. Providing guidance on the use of materials for housing construction and on the use of residential vegetation.
8. Developing innovative firefighting and safety techniques at the WUI.
9. Becoming aware of WUI fire risk, familiarizing with fire resistant materials and pyro-gardening practices.
10. Learning about self-protection and preparedness measures in case of fire or early evacuation.

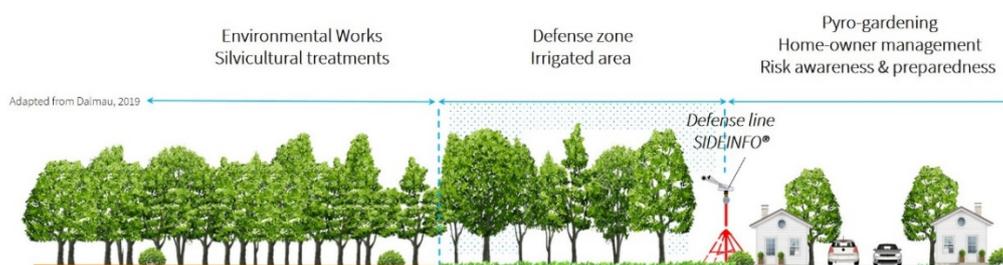
Most of these 10 actions demand an interaction and strong cooperation between different members of the WUI fire community, and as such these have to be performed through inclusive and participatory methodologies in all stages. We need all actors genuinely engaged, we have to cooperate together but we have to know each other to cooperate!

The Guardian project is a pioneering model whose aim is to contribute to several actions gathered in the *Decalogue* with an inclusive approach between urban authorities, universities, engineering companies and local agencies. In Journal 1 we give a detailed picture of what Guardian is about, highlighting the main objectives and milestones, but let's try to summarize it in a nutshell...

The role of the Guardian project

The GUARDIAN project proposes a full combination of strategies to mitigate fires in wildland-urban interfaces relying on a smart use of water, on cost effective and sustainable ecosystem treatments and on population and target beneficiaries education and awareness. GUARDIAN aims at making the municipalities of Riba-Roja and Paterna (Comunitat Valenciana, Spain) WUI fire-resilient through the implementation of:

- a) An innovative firefighting system involving a full hydraulic infrastructure to deliver recycled water through sprinkler towers to the wildland-urban interfaces.
- b) A training program for citizens to increase fire risk perception and self-protection capabilities.
- c) Environmental works to improve ecosystems' conditions at Natural Park "Parc Natural del Túria"



Guardian project sketch. Source: Medi XXI

The approach, methods and some key technology used in GUARDIAN are pioneering the frontline of fire prevention and protection in the WUI. The knowledge and the tools are here and available. During this next years, we the GUARDIAN family will be playing our part.

What about you? Either you take the challenge and move on... or do nothing and regret it later!



"Thank you firefighters!" Source: Medi XXI