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Legal Regulation of Fuel Management Areas

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Abstract

Fuel management areas (FMA) can be classified depending on their different objectives, as primary, secondary and tertiary, and can be made up of firebreaks when fuels are totally removed, fuelbreaks and shaded fuelbreaks when land remains covered by vegetation, but fuels are reduced in volume and flammability. Given the recognized importance of these areas (as defensible spaces), but also their variety, they may be found in several legislations but regulated in quite different modes. In general terms, however, it is possible to observe that there are common features which are considered in the legal regulation of fuel management, mostly at the wildland-urban interface: the location of the land; its wildfire hazardousness and the type of activity and vegetation present on the property and its surroundings. Portuguese legislation distinguishes between primary, secondary and tertiary fuel management areas, but adopts a very simplified approach to secondary FMA, considering only the type of activity at hand and the type of land (forest or agricultural) in the surroundings, and no other relevant factors as topography, climate and concrete vegetation. This contribution focuses on secondary areas and defines their main traits, from the point of view of legal regulation, and also the difficulties in their operationalisation. This article is an output of the project House Refuge (PCIF/AGT/0109/2018), funded by the Portuguese Foundation for Science and Technology.

1. Introductory remarks

Fuel management plays a crucial role in preventing forest fires and especially mega-fires and their consequential damages to lives, environment and property (ANDERSON/ANDERSON, 2012).

However, because they involve actions with long term results, highly complex and technical, and because the technical precepts that fuel management involves are very hard to translate into law, they ended up receiving little attention for many years within the legal field, when the focus on forest fire policies was placed on actions of suppression of forest fires, which have more immediate result, especially in countries affected by large fires, such as Portugal (BENTO-GONÇALVES, 2021) and USA (BUSENBERG, 2004; ANDERSON/ANDERSON, 2012; STEPHENS, 2016). Yet the increase in the incidence and size of fires has highlighted the importance of adequate regulation of fuel management and investment in this sector.

Fuel management areas (FMA) can be classified depending on their different objectives, as primary, secondary and tertiary. Also, they can be made up of firebreaks when fuels are totally removed or extremely reduced in usually linear areas, in order to diminish the intensity of a fire and allow for an easier access to fire related departments and forces; fuelbreaks, when fuels are greatly reduced in volume and flammability and shaded fuelbreaks that include vegetation but at a low density, in order to break up the continuity of fuel and limit the fire progression (ASCOLI et.al., 2020).

Given the recognized importance of these areas as *defensible spaces*, but also the various factors that influence fire behaviour and therefore the technical requirements for fuel management, they may be found in several legislations but regulated in quite different modes, as the particularities of the place where management is carried out must be taken into consideration (VIEGAS, 2005).

The purpose of this contribution is to give a broad framework of the international regulation models of fuel management in particular at the wildland-urban interface (WUI) and also to analyse in more detail the legal solutions in Portugal.

2. Regulation types of fuel management areas

Although the legal regulation of FMA in WUI in different countries is not uniform, common features can be found regarding fuel management conditions, the size of fuel management strips and those responsible for rule-making, implementation and, eventually, enforcement.

In the table below we highlight some examples of foreign regulation of fuel management in what regards fuelbreaks, such as the state of Victoria in Australia, the state of California in the USA and France. Note that in the first two countries, the regulation of the fuel management rule is left to the states, while France establishes a general rule that can be altered by regulations drawn up by fire-prone regions (Code Forestier, Article L131-14).

Country	**Rules of fuel management**	**Responsible entity**
Australia (State of Victoria)	10/50 and 10/30 rules of fire management: building a firebreak area within 10 meters of the house, with the removal of all the vegetation in this area, and one fuelbreak area within 30 or 50 meters – depending on the hazardousness of the area	Owners or those with administration powers
USA (State of California)	Three different zones of fuelbreaks: 1st: area up to five feet around the house in which the responsible person has to build a fuelbreak area removing the flammable vegetation. 2nd: 5 to 30 feet zone, requires management actions such as the creation of fuel breaks with driveways and decks, spacing trees and the removal of the fuel under them. The 3rd zone (30 to 100 feet) only takes place if the administration considers that the other areas are not sufficient due to accentuated risks (NFPA, 2022).	Id.
France	Around buildings: General rule to reduce the vegetable fuel within a 50 m area surrounding the buildings on lands located up to 200 meters from forests.	Id. The owners can request the municipalities to carry out fuel management and its maintenance, but they remain responsible for the costs of these operations (Code Forestier, article L131-14).

In general terms, it is possible to observe that there are common features which are considered in the legal regulation of fuel management in those countries and that influence the different dimensions and practices of fuel management: the location of the land; its wildfire hazardousness; the presence of homes in the surroundings; the type of the activity undertaken and the kind of the vegetation present on the property and vicinities.

There has been some consensus on the main factors that lead to a wildfire, on the need to take action to reduce hazardous fuel levels and safeguard wildland-urban interface communities, and on the range of conditions that should be considered when delimiting FMA's. Naturally, since many firebreaks are located in private areas, legislations place legal duties on owners or administrators of the property to prepare and maintain them. Therefore, it is necessary to translate technical requirements into law so that those demands are complied with, and, in case of failure to comply, so that legal consequences are applied (for instance administrative or criminal sanctions or civil responsibility claims).

For law to be effective it is necessary that rules are consistent and understandable and also that their scope (which rules apply to whom, when and where) is clearly defined, so that their addressees know what is expected from them at any point in time and space. This means that in the wildland-urban interface, unless specific

planning instruments are adopted that detail rules based on susceptibility of wildfires in concrete defined areas, it is difficult to include a wide range of variables when defining which legal rules to apply.

This is particularly apparent when considering the situation of homes or other human activities near slopes. Despite the fact that this is the most dangerous location for such uses (https://www.portugalwildfires.com/wildfires-on-slopes/), it is quite challenging to define a general rule on firebreaks (for a whole country, a state, a department or even a municipality) that complies with the legal demands of certainty and predictability. The wildfire hazardousness of an area could and should indeed take into consideration this factor (if the area of reference is mainly slopy or not); however, this is an approximate exercise that might not lead to the best definition of the concrete conditions under which firebreaks should be established.

Nonetheless, this need not be an unsurmountable task. Law is not a straitjacket (KEITER, 2006) and allows for moments of flexibility, as long as applicable legal solutions are duly framed into specific instruments (for instance territorial or land management plans) made known to the public. In addition, law is a tool for engagement and change and can, therefore, play an important role in addressing relevant societal challenges, such as wildfires. This implies the involvement of all actors, public and private, and the adoption of balanced solutions that are technically adequate, but also legally sound.

3. Portuguese regulation of fuel management areas

After this bird veil on existing types of regulation across several countries and the importance of an adequate legal regulation, a more precise look should be directed to the Portuguese Legal System. Let's start without delay, observing firstly that Portugal is undergoing a period of normative change. Decree Law no. 124/2006, 28 June, established the National Defense of Forest against Fires System (SNDFCI), and regulated, among many other instruments, FMA of primary, secondary and tertiary nature (Articles 13 to 15). Despite the fact that Article 15 of Decree Law no. 124/2006, that regulates secondary FMA is still in force in many Municipalities, according to article 79(4) of Decree-Law no. 82/2021, 13 October, this new piece of legislation is, from the 1st of January 2002 onwards, the basic framework of the Integrated Rural Fire Management System (SIGFR).

According to SGIFR, fuel management is defined as the creation and maintenance of horizontal or vertical discontinuity of the fuel load, through modification or partial or total removal of the plant biomass and the composition of plants, using the most recommended techniques with the intensity and frequency appropriate to meet the objectives of the intervened spaces [Article 3(1)(g)]. FMA functions are referred to in Article 47(2).

Three FMA are established. Primary FMAs correspond to linear strips in rural areas that have a standard width of 126 m and compartmentalize areas that should preferably have between 500 and 10,000 ha. These areas are managed and executed by the Portuguese State and defined in Regional Action Programs (Article 49). On the other side of the spectrum tertiary FMAs are of local interest and are to be defined in more concrete forest management instruments (Article 51).

As for secondary FMAs, they are established in Article 49 and can be summarized in the following table:

Type of activity	**General rule of fuel management**	**Responsible entity**
Road network	10 m outside the limits of the carriageway	Entities (public/private) responsible for the infrastructures
Railway network in operation	10 m from the outer rails	Id.
Very high voltage and high voltage electric power transport and distribution lines	Strip corresponding to the vertical projection of the outer conductor cables + a strip 10 m wide on each side	Id.
Medium voltage electric power distribution lines	Strip corresponding to the vertical projection of the outer conductor cables + a strip 7 m wide on each side	Id.

Low voltage electrical power distribution lines, with conductor cables without electrical insulation	Strip not less than 3 m wide on either side of the vertical projection of the conductor cable	Id.
Gas and oil products transportation network	7 m from the duct axis to each side	Id.
SIRESP (communication system for emergency and security) support infrastructures	Surrounding strip with a width of 7 m	Id.
Camping and caravan parks, hotels, hazardous activities that may lead to grave accidents, industrial establishments and entrepreneurial areas, fuel stations, logistics platforms, electricity or gas production and storage facilities and sanitary landfills	Surrounding strip with a standard width of 100 m	Owners, lessees, usufructuaries or entities that, in any title, administer the land within the strip
Surroundings of built-up areas, when bordering forest land	Surrounding strip with a standard width of 100 m from the interface of built-up areas	Id.
Buildings that are being used for housing or economic activities, if the 50 m band covers forest land	Standard width of 50 m, measured from the outer masonry of the building	Id.
Buildings that are being used for housing or economic activities, if the band covers agricultural land	Standard width of 10 m, measured from the outer masonry of the building	Id.

These rules are applicable to all areas except for built-up areas where fuel management is carried out in accordance with municipal regulations [Article 49(9) and Article 3(1)(b)], regardless of their wildfire hazardousness or location in fire prone areas. Also, the size of the FAM is "watertight" and does not take into account the specific conditions of the terrain, being too large in some cases and insufficient in others (i.e. properties located in slopes, for instance).

The legal regulation in Portugal is therefore oversimplified, taking only in consideration the type of activity at hand and the type of land (forest or agricultural) in the surroundings, and no other relevant factors as topography, climate and concrete vegetation, and, therefore, not being sufficiently multidisciplinary and multifunctional in its scope (VIEGAS et al., 2020).

The SGIFR tends nonetheless to introduce some plasticity to this general legal framework in two different ways:

a) the admissibility of *compatible uses* in the FMA, seen as the occupation of land in a manner different from that foreseen in the fuel management standards, as long as it is compatible with the objective of fuel management, reducing its availability for the ignition and progression of fire, and generates value for the owners or communities [Article 3(1)(k)];

b) and the *flexibility* of the FMA width, in duly justified cases, and depending on the hazard and wildfire fire risk, up to 50 /prct. greater or less than that established in these paragraphs 4 to 7 may be adopted [Article 49(2)].

These possibilities need to the included into the newly introduced (and not yet in adopted) subregional programs (Article 34). Hence, so far, the terms of such compatibility and flexibility possibilities are indeterminate.

4. Conclusive remarks

Translating technique into law is not an easy task. The demands of a dynamic and flexible framework that prevents wildfires and reduces the devastation of their effects, needs to be compatibilized with the logic of law, that aims at fair, but also, stable rules and results (LOPES, . The legal regulation of secondary fire management

areas tends to such a balance, at the price of, in some cases, excessively reducing the technical complexity of fire management techniques, as can be seen in the Portuguese case.

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