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5º Simpósio Sul-Americano sobre Controle de Incêndios Florestais

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AERIAL WILDLAND FIREFIGHTING RESOURCES IN FIRE SUPPRESSION ACTIVITIES: AN EXAMPLE USDA FOREST SERVICE

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Abstract

Wildfires are a significant social problem affecting millions of people worldwide and causing major economic impacts at all levels. In the US, the severe fires of 1910 in Idaho and Montana galvanized a fire policy excluding fire from the ecosystem by the U.S. Department of Agriculture Forest Service (USDAFS). Fire management policy changed in 1935, 1978, 1995, and 2001. However, the fire problem remained unabated, in part, because of the large hazardous fuel loads created by the fire-exclusion policies of the past and the tremendous influx of population in the wildland-urban interface. This is not a problem exclusive to the US. Recent wildfire events worldwide

have raised awareness of the dangers and seriousness of the problem. Examples of this, in the western United States, are the numerous catastrophic wildland-urban interface fires over the past decade. Most recently this is evidenced by the large disastrous wildfires in Greece in 2007, in Australia in 2009, and in Russia in 2010. These events resulted in significant loss of lives, homes, and economic activity. Global estimates of the area affected by wildfires range anywhere from 3 to 6 million square kilometers annually.

Governmental and privately financed agencies with responsibilities for wildland fire management programs and protection organize themselves very similarly throughout the world. In the United States, wildland fire management programs include five principal components: prevention, detection, and suppression (collectively termed preparedness), fuels management, and suppression. Expenditures for suppression and suppression activities are the most costly. The firefighting resources used during suppression activities include ground forces with hand tools (different types of crews varying in composition from 2 to 20 persons), mechanized forces (fire engines, bulldozers, water tenders, etc.), aerial delivered crews (helitack crews, smoke jumpers), and aerial resources (transportation planes, helicopters, lead planes, air tankers).

In the United States the period between 1923 and 1970 saw a tremendous increase in USDAFS fire suppression capabilities, in part because of innovations developed by the agency's research branch (air tanker drops, helitorch, fire shelter, and hand tools like the McLeod, and Pulaski), and because the surplus of material available after the termination of WWII and the Korean conflict. During this era, USDAFS acquired mechanized vehicles as well as numerous helicopters and airplanes, permitting it to pursue an aggressive nationwide program of aerial firefighting and an on-the-ground mechanized attack. An important measure contributing to the expanding capabilities of USDAFS was the *federal surplus equipment program*, which provided military surplus equipment to the agency. A relevant component of the surplus program was the ability to transfer equipment acquired through this program to cooperating states, building the cooperators' capabilities, as well as creating a formidable nationwide fire-suppression organization.

The acquisition of aerial equipment allowed firefighting crews to fly the first missions to drop water over wildland fires trying to suppress them or reduce their intensity and advancement until ground crews arrived. The very first aerial mission was flown in 1930 using a wooden beer keg to drop water. After WWII ended, surplus vintage planes received by the

USDAFS made possible the first free-flowing water airdrop from an airplane onto a fire. This happened during the Mendenhall Fire, August 13, 1955, on the Mendocino National Forest, California, when

6 loads of water were dropped in support of ground firefighters. The operation was a success and the fire was controlled. The era of aerial wildland fire suppression had begun!

By 1956, research results made clear that for water drops to be effective weather conditions had to be near perfect. Weather conditions severely affect water drops, particularly during hot or windy days in which hardly any water reaches the ground. A temporary solution to this problem was the mixing of sodium calcium borate with water. However, research results showed that this combination contributed to soil sterilization. A more suitable solution was the mixing of bentonite with water. However, because of the bentonite retardant weight and the small capacity of the existing planes retardants were useless on large fires.

By 1960, use of the US Navy TBM Avenger increased the effectiveness of fire suppression operations. This was the first airplane converted to handle slurry drops dedicated to aerial firefighting and capable of dropping over 2000 liters (600

gallons) of retardant at a time. However, even this increase in capacity was not enough to handle large fires, particularly those in thick forests or at higher elevations. The 1960s saw an increase in the availability of surplus multiengine airplanes capable of delivering up to 9,250 liters (2,500 gallons) of retardant improving their effectiveness on large fires.

After more than 60 years of usage, aerially applied retardant is known to reduce the spread and intensity of fires and slow larger, more damaging, and therefore, more costly fires. Under some circumstances, the use of retardants because the surplus of material available after the termination of WWII and the Korean conflict. During this era, USDAFS acquired mechanized vehicles as well as numerous helicopters and airplanes, permitting it to pursue an aggressive nationwide program of aerial firefighting and an on-the-ground mechanized attack. An important measure contributing to the expanding capabilities of USDAFS was the *federal surplus equipment program*, which provided military surplus equipment to the agency. A relevant component of the surplus program was the ability to transfer equipment acquired through this program to cooperating states, building the cooperators' capabilities, as well as creating a formidable nationwide fire-suppression organization.

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After more than 60 years of usage, aerially applied retardant is known to reduce the spread and intensity of fires and slow larger, more damaging, and therefore, more costly fires. Under some circumstances, the use of retardants is the most effective and efficient way of helping wildland firefighters to protect lives, resources, property (public and private), and facilities. In other occasions, is the only tool available!

As the most visible symbol of fire suppression efforts, aircraft can be the single most expensive firefighting resource on a large wildland fire. In the USA,

agencies pay for a guaranteed availability and additional per-hour flight cost when using aircrafts. Aircraft costs may account for more than one-third of the total suppression costs on large wildfires

At the national level, the Federal Government is probably the largest user of aircrafts in wildland fire suppression efforts and the first one to use them in this capacity. Of the five natural resource agencies with Federal wildland fire protection responsibilities, the USDAFS is the largest user of aircrafts in wildland fire suppression. Since first introduced in the 1930s, aerial fire suppression activities have been a constant tool in the USDAFS wildland fire suppression arsenal.