



Fire Situation in Colombia

Fire environment, fire regimen, ecological role of fire (or the vegetation and fire characteristics of the region in which country is located)

Degradation and losses of natural heritage represented in soil, water and biological resources as a result of wildfires that affect tropical ecosystems in Colombia need to be known and attended by the international fire community.

Colombia is located on the north-western corner of South America at the inter-tropical zone. A wide range of altitudes (0 – 5,588 m a.s.l.), combined with high humidity regions (2,000 – 12,000 mm average of annual precipitation), constitute factors that provide conditions for large biological and geomorphologic diversity.



Figure 1. Location map of Colombia. Source: Courtesy of National Geographic Society.

The national continental surface has been organized on five geographical regions; Andean, Caribbean, Pacific, Amazon and Eastern Savannahs, with four main different vegetation covers; Andean forest, rain forest, *paramo* and savannah. A lot of biological species were developed according to these special ecological characteristics.

The fires affect in different ways almost all vegetation types even tropical rain forests; following the general climate regimen which is characterized by two annual wet - dry seasons, now is been recognized that main fire seasons are related with special climate conditions associated with ENSO (El Niño - Southern Oscillation) episodes. At this time just the savannah ecosystem shows species with evident adaptations to fire. In the other ones fire is consider as a non-active ecological element that produces complex changes in the vegetation's structure and composition that affect biological balances.

Narrative summary of major wildfire impacts on people, property, natural resources during the 1990s (to include effects on public health)

In the 1980s and 1990s fire events affected both rural and urban communities mainly by threatened water supplies due to disturbance or destruction of catchments areas (Andean forests and *paramos*) negatively

affecting water quality and yield. Additional negative effects were noted such as loss of soil fertility, biodiversity, and air pollution. Savannah burning is recognized as a major contributor to the release of greenhouse gases in the Colombian agricultural sector.



Figure 2 and 3. Shrub species (*Chaparro*) adapted to fire regimes of the savanna ecosystem. Photos: M.E. Silva.



Figures 4 to 6. Ecological damages caused by fires in the Darien gap zone, a humid forest ecosystem (1998). Photos: M.E. Silva.



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Almost all fires are human-caused events except some lightning fires in the savannah biome. Intensive use of fire throughout the country for agricultural practices, grazing and hunting is perhaps the most common fire cause. It is important to define other fire causes as land- ownership conflicts and terrorist acts against natural resources.

The Colombian natural heritage has been recognized as one of the most important around the world in terms of biodiversity. The *paramo*, an Andean ecosystem is located above 3.000 m altitude and its upper level reaches almost 4.500 m. Despite its function as marvellous water catchment this vegetation belt burns easily in extreme dry seasons. Fire suppression operations with ground crews in these ecosystems are really difficult. It seems to be evident that this ecosystem which formerly had been characterized by high humidity and low flammability has lost these characteristics. During the drought of 1998 wildfires burned extended forests in Los Katios National Park (a UNESCO Natural Heritage Site) at the Darien gap zone (near the Panama border), located in one of the most humid regions of the earth.

Fire database: Wildland fire statistics

A wildland fire database has been compiled as an initial effort to establish a National Fire Monitoring System. Tables 1 and 2 reveal a trend of increasing fire occurrence since the late 1980s.

Operational fire management system and organization

Wildfire protection is a responsibility shared between the National Environment System, leaded by the Ministry of Environment Affairs and the National Disasters Response System. Operationally, prevention and suppression tasks are carried out by a number of emergency services and government agencies (Voluntary Fire Departments, Civil Protection, Regional Environment Agencies, National Red Cross, Police, Army, Air Force, etc). A Forest Service has not been established so far despite of a law of 1989 that ordered its creation. Forest research is a responsibility of the Hydrology, Meteorology and Environment Research Institute (IDEAM).

During the last extreme fire season 1997-1998, an emergency plan has been developed. With the assistance of Chilean International Technical Cooperation training was provided as well as the procurement of suppression equipment for voluntary land wildfire fighters and paid crews. Total investment was \$US 1.2 million.

Despite that Colombia is mainly a mountain territory, there is no aerial support for fire detection and suppression. The Air Force exceptionally provides helicopters (UH-1H, UH-60) with *Bambi* buckets. Light air

tankers (Dromaders, Air-Tractors and Turbo Thrushes), normally used in agricultural practices or illegal crops control have been temporarily converted to fire-fighting aircraft.

Table 1. Wildland fire statistics of Columbia for the period 1980-1989. Source: MMA-DGPAD-IDEAM.

Year	Total No. of Fires on Forest, Other Wooded Land, & Other Land	Total Area Burned on Forest, Other Wooded Land, & Other Land	Area of Forest Burned	Area of Other Wooded Land and Other Land Burned	Human Causes	Natural Causes	Unknown Causes
	No.	ha	ha	ha	No.	No.	No.
1980	N.D.	N.D.					
1981	N.D.	N.D.					
1982	N.D.	N.D.					
1983	N.D.	N.D.					
1984	N.D.	N.D.					
1985	N.D.	N.D.					
1986	13	58	N.D.	N.D.	N.D.	N.D.	N.D.
1987	8	40	N.D.	N.D.	N.D.	N.D.	N.D.
1988	9	927	N.D.	N.D.	N.D.	N.D.	N.D.
1989	65	13,519	N.D.	N.D.	N.D.	N.D.	N.D.
Average			N.D.	N.D.	N.D.	N.D.	N.D.

Table 2. Wildland fire statistics of Columbia for the period 1990-2002. Source: MMA-DGPAD-IDEAM.

Year	Total No. of Fires on Forest, Other Wooded Land, & Other Land	Total Area Burned on Forest, Other Wooded Land, & Other Land	Area of Forest Burned	Area of Other Wooded Land and Other Land Burned	Human Causes	Natural Causes	Unknown Causes
	No.	ha	ha	ha	No.	No.	No.
1990	66	190					
1991	146	39,817					
1992	188	16,084					
1993	46	495					
1994	125	1,087					
1995	571	7,915					
1996	336	9,549					
1997	10,289	164,736					
1998	1,787	52,351					
1999		4,210					
2000		5,451					
2001		52,424					
2002 (Jan. to Sep)		34,700					



Figure 7. Firefighting instruction - a joint effort by the rural community and the National Park Service. Photo: M.E. Silva.

Radio and television media fire prevention campaigns have been broadcasted in the main fire seasons. Assisted by some small forestry companies (Smurthit, RefoCosta, etc.) fire prevention and suppression tasks were supported.

The dimension of main wildfires occurred in the 1990s varied between 1,000 and 80,000 ha per fire. These events were finally all controlled by natural conditions. Main fire suppression operations were characterized by the lack of professional wildfire fighter crews. Interagency cooperation problems made fire suppression tasks largely difficult.

Fire management practices and use of prescribed fire

Fire management is a concept that is not widely accepted by both government officers and farmers. The use of fire in rural areas is a common practice that allow small-farm production and maintenance of cattle pasture land. However, the lack of appropriated techniques or official technical assistance the small land-clearing fires are the main cause for uncontrolled wildfires.

Prescribed fire is used only on large farms with agricultural objectives, e.g. in sugar cane burning in Cauca valley region (refined sugar industries). Foresters or fire departments do not use prescribed fire to reduce fuels or for other land management purposes.

Public policies concerning fire

A national fire management policy has not been defined, despite wildfires are recognized as a threat to forests and non-forest lands. The use of fire in the agricultural sector is regulated by law. However, in reality the law is not implemented or enforced.

The lack of a Forest Service has resulted in the distribution of fire protection responsibilities to multiple governmental agencies which give attention to the fire problem only in severe fire seasons. In the *Regulations for Firefighters* there is no category of *wildland firefighter*.



Figures 8, 9. Firefighter crews prepared to control fires in savannahs, a joint effort of the National Park Service and the Air Force. Photos: M.E. Silva.

Public policies concerning fire

There a number of decrees and laws are in place that regulate policies and responsibilities concerning forest protection and fire management (Table 3).

Table 3. Overview on decrees and laws regulating policies and responsibilities concerning forest protection and fire management in Colombia.

Decree 2762, 1973	Creation of a "National Wildfire Prevention and Suppression Council" (actually not established).
Law 46,1988 Decree-Law 919, 1989	Creation of a "National Disasters Prevention System". A Fire-Fighting System is established.
Law 37,1989	"National Forest Development Plan". Creation of National Forest Service (no operational structure defined).
Law 99,1993	Creation of the "National Environment System". Ministry for Environment Affairs is established.
Decree 948, 1995	Air pollution regulations. The use of fire in the agricultural sector is controlled.
Compes document 2834, 1996	Establishment of a National Forest Policy and a "National Fire Prevention and Mitigation Advisory Council"

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