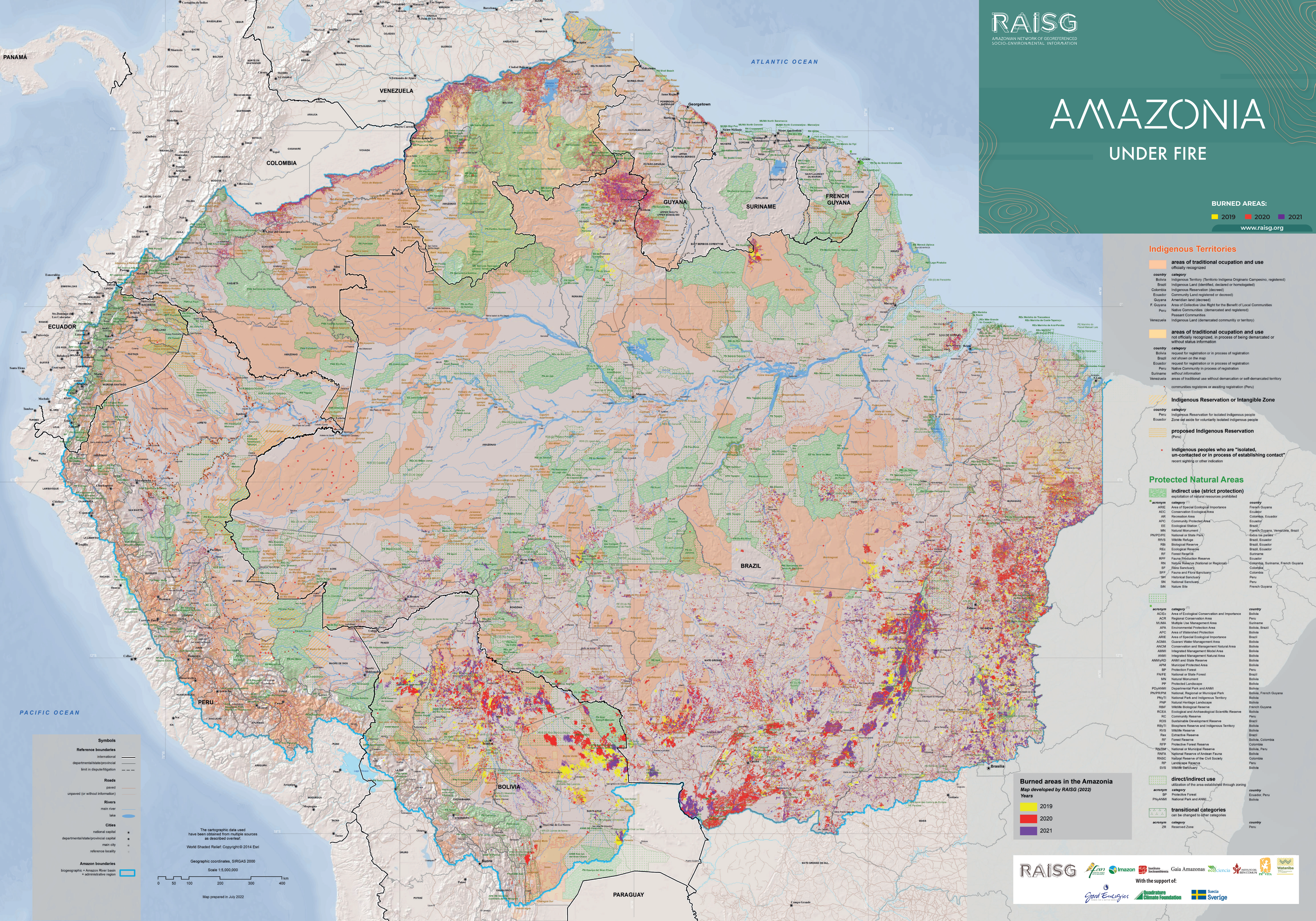


AMAZONIA

UNDER FIRE

BURNED AREAS:
■ 2019 ■ 2020 ■ 2021
www.raisg.org



Indigenous Territories

country	category	description
Bolivia	Indigenous Territory (Territorio Indígena Originario Campesino, registered)	areas of traditional occupation and use officially recognized
Brazil	Indigenous Land (identified, declared or homologated)	areas of traditional occupation and use not officially recognized, in process of being demarcated or without status information
Colombia	Indigenous Reservation (decreed)	areas of traditional occupation and use not officially recognized, in process of being demarcated or without status information
Ecuador	Community Land (registered or decreed)	areas of traditional occupation and use not officially recognized, in process of being demarcated or without status information
Guyana	American land (decreed)	areas of traditional occupation and use not officially recognized, in process of being demarcated or without status information
F. Guyana	Area of Collective Use Right for the Benefit of Local Communities	areas of traditional occupation and use not officially recognized, in process of being demarcated or without status information
Peru	Native Communities (demarcated and registered)	areas of traditional occupation and use not officially recognized, in process of being demarcated or without status information
Venezuela	Peasant Communities	areas of traditional occupation and use not officially recognized, in process of being demarcated or without status information
	Indigenous Land (demarcated community or territory)	areas of traditional occupation and use not officially recognized, in process of being demarcated or without status information

Indigenous Reservation or Intangible Zone

country	category	description
Peru	Indigenous Reservation for isolated indigenous people	Indigenous Reservation or Intangible Zone
Ecuador	Zone set aside for voluntarily isolated indigenous people	Indigenous Reservation or Intangible Zone

proposed Indigenous Reservation (Peru)

- indigenous peoples who are "isolated, un-contacted or in process of establishing contact" recent sighting or other indication

Protected Natural Areas

country	category	description
Brazil	Area of Special Ecological Importance	indirect use (strict protection)
Brazil	Conservation Ecological Area	indirect use (strict protection)
Brazil	Recreation Area	indirect use (strict protection)
Brazil	Community Protected Area	indirect use (strict protection)
Brazil	Ecological Station	indirect use (strict protection)
Brazil	Natural Monument	indirect use (strict protection)
Brazil	National or State Park	indirect use (strict protection)
Brazil	Wildlife Refuge	indirect use (strict protection)
Brazil	Biological Reserve	indirect use (strict protection)
Brazil	Ecological Reserve	indirect use (strict protection)
Brazil	Forest Reserve	indirect use (strict protection)
Brazil	Fauna Protection Reserve	indirect use (strict protection)
Brazil	Nature Reserve (National or Regional)	indirect use (strict protection)
Brazil	Flora Sanctuary	indirect use (strict protection)
Brazil	Fauna and Flora Sanctuary	indirect use (strict protection)
Brazil	Historical Sanctuary	indirect use (strict protection)
Brazil	National Sanctuary	indirect use (strict protection)
Brazil	Nature Site	indirect use (strict protection)

direct/indirect use

country	category	description
Bolivia	Area of Ecological Conservation and Importance	direct/indirect use
Bolivia	Regional Conservation Area	direct/indirect use
Bolivia	Multiple Use Management Area	direct/indirect use
Bolivia	Environmental Protection Area	direct/indirect use
Bolivia	Area of Watershed Protection	direct/indirect use
Bolivia	Area of Special Ecological Importance	direct/indirect use
Bolivia	Clean Water Management Area	direct/indirect use
Bolivia	Conservation and Management Natural Area	direct/indirect use
Bolivia	Integrated Management Model Area	direct/indirect use
Bolivia	Integrated Management Natural Area	direct/indirect use
Bolivia	ANMI and State Reserve	direct/indirect use
Bolivia	Municipal Protected Area	direct/indirect use
Bolivia	Protection Forest	direct/indirect use
Bolivia	National or State Forest	direct/indirect use
Bolivia	Natural Monument	direct/indirect use
Bolivia	Protected Landscape	direct/indirect use
Bolivia	Departmental Park and ANMI	direct/indirect use
Bolivia	National, Regional or Municipal Park	direct/indirect use
Bolivia	National Park and Indigenous Territory	direct/indirect use
Bolivia	Natural Heritage Landscape	direct/indirect use
Bolivia	Wildlife Biological Reserve	direct/indirect use
Bolivia	Biological Reserve and Indigenous Territory	direct/indirect use
Bolivia	Community Reserve	direct/indirect use
Bolivia	Sustainable Development Reserve	direct/indirect use
Bolivia	Biosphere Reserve and Indigenous Territory	direct/indirect use
Bolivia	Wildlife Reserve	direct/indirect use
Bolivia	Extractive Reserve	direct/indirect use
Bolivia	Forest Reserve	direct/indirect use
Bolivia	Protective Forest Reserve	direct/indirect use
Bolivia	National or Municipal Reserve	direct/indirect use
Bolivia	National Reserve of Andean Fauna	direct/indirect use
Bolivia	Natural Reserve of the Civil Society	direct/indirect use
Bolivia	Landscape Reserve	direct/indirect use
Bolivia	Wildlife Sanctuary	direct/indirect use

Burned areas in the Amazonia
 Map developed by RAISG (2022)
 Years:
■ 2019 ■ 2020 ■ 2021

Symbols

Reference boundaries
 international
 departmental/state/provincial
 limit in dispute/litigation

Roads
 paved
 unpaved (or without information)

Rivers
 main river
 lake

Cities
 national capital
 departmental/state/provincial capital
 main city
 reference locality

Amazon boundaries
 biogeographic + Amazon River basin
 administrative region

The cartographic data used have been obtained from multiple sources as described overleaf.
 World Shaded Relief. Copyright © 2014 Esri

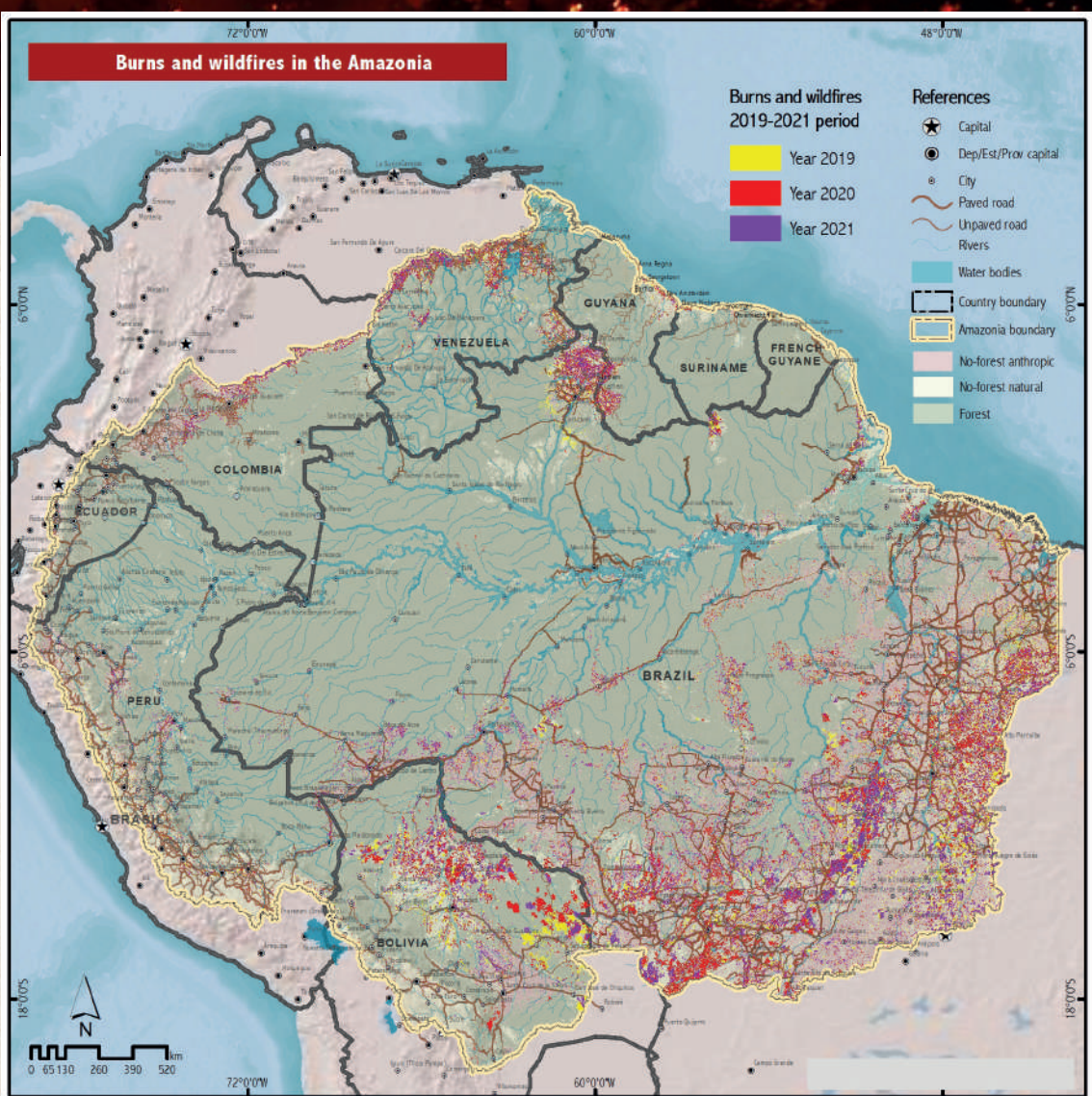
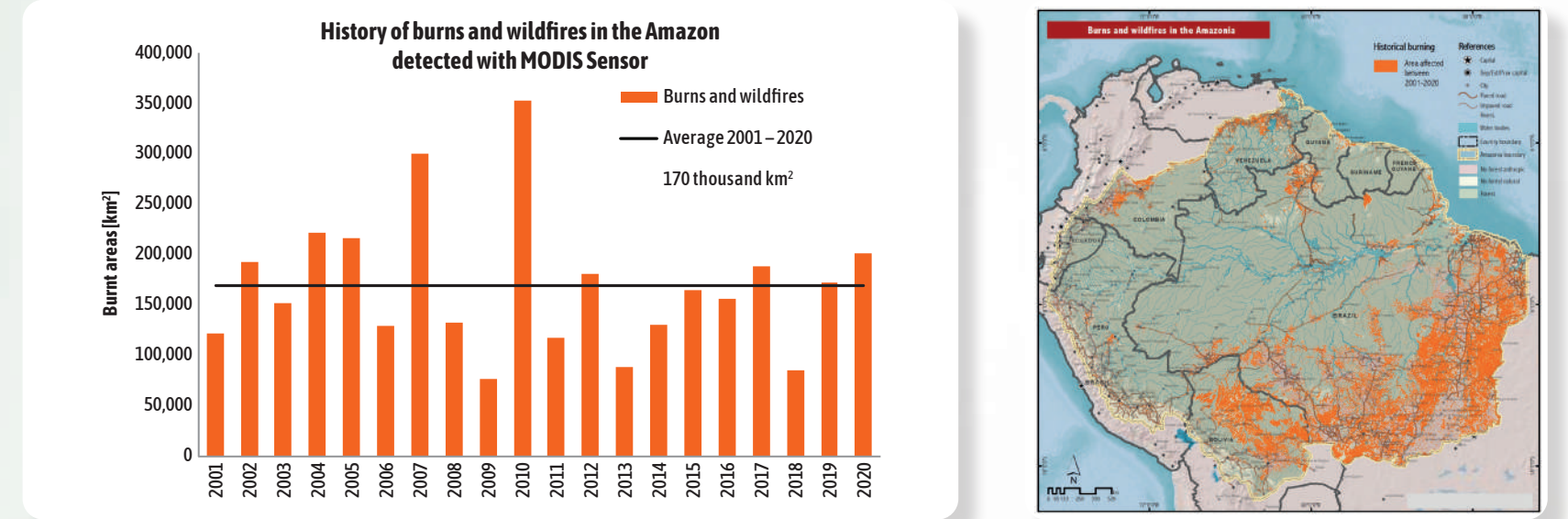
Geographic coordinates, SIRGAS 2000
 Scale 1:5,000,000
 Map prepared in July 2022

AMAZONIA IMPACTED BY BURNS AND WILDFIRES

THE AMAZONIA UNDER FIRE map is the outcome of an analysis of the areas affected by burns and wildfires throughout the years 2019, 2020 and 2021. As a result of this collaborative work, the Amazonian Network of Geo-referenced Socio-environmental Information (RAISG), describes the dimensions of wildfires under a regional and national approach, with a special emphasis on Natural Protected Areas (NPAs) and Indigenous Territories (ITs). RAISG is a network of civil society organizations that work articulated under an integral vision of the Amazonia.

The Amazonia is delimited under biogeographical, hydrological (basins), and political-administrative criteria. It covers a total area of 8,470,209 km² and is integrated by nine Amazonian countries: Brazil (62%), Peru (11%), Bolivia (8%), Colombia (6%), Venezuela (5.6%), Guyana (2.5%), Suriname (1.7%), Ecuador (1.6%) and French Guyana (1%). Physiographically, the Amazonia has an Andean region in the west, a Guiana component in the north, and lowlands predominate in the center and south.

Wildfires in the Amazonia do not distinguish boundaries and are one of the greatest pressures on its ecosystems. Between 2001 and 2020, monitoring using the MODIS (Moderate Resolution Imaging Spectroradiometer) sensor quantified that the recurrence of fires affected 14% (1,208,162 km²) of the region, an area like Bolivia, impacting an average of 170,000 km² per year, an area comparable to Uruguay.

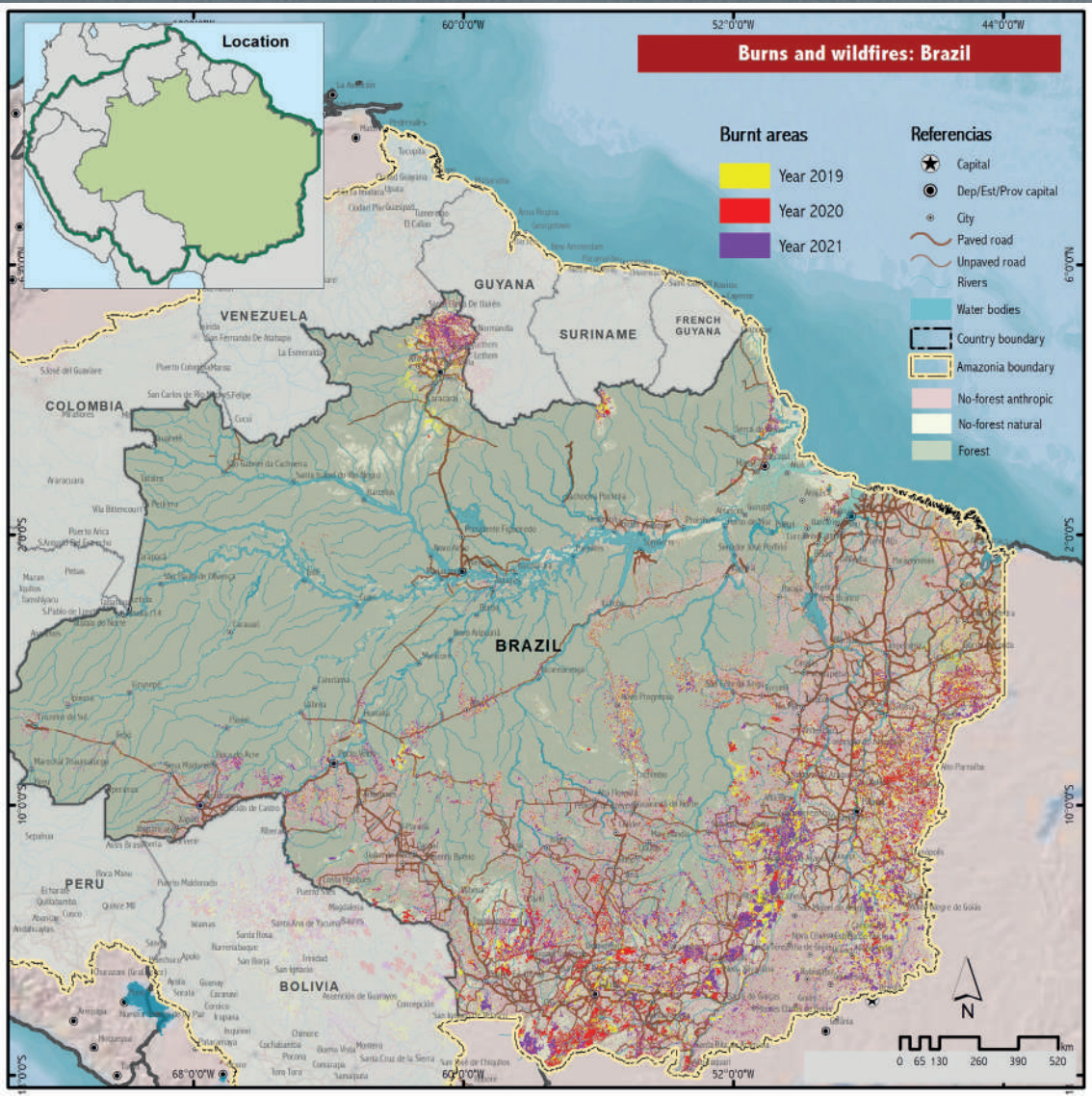


The southern region of the Amazonia is the most affected by burning and wildfires, particularly in Brazil through the states of Mato Grosso, Goiás, Tocantins, and Maranhão.

In Bolivia, fires are prevalent in the departments of Beni and Santa Cruz. In Peru, the affected areas are concentrated in the department of Ucayali and the Andean Amazon.

In the north of the Amazon, burns and wildfires occur more in Venezuela, mainly in the states of Bolívar and Amazonas.

Colombia also stands out in the central-western region of the country in the departments of Meta, Caquetá, and Guaviare. Between the frontiers, fires are concentrated in the ninth region of Guyana (Upper Takutu-Upper Essequibo) and the state of Roraima in Brazil.



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AMAZONIA UNDER FIRE IN THE YEARS 2019, 2020 AND 2021

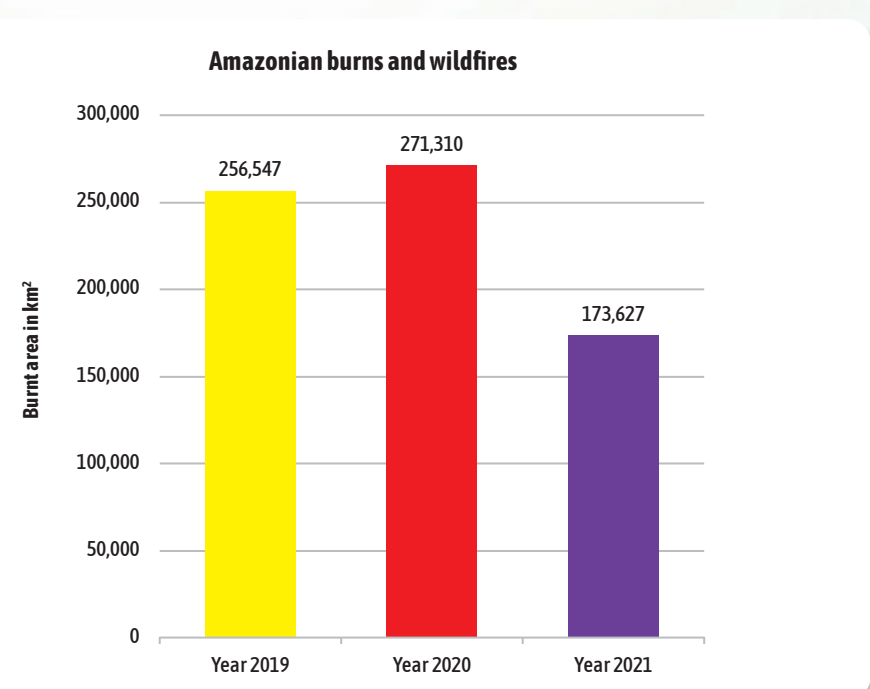
Although fires in the Amazonia have occurred historically, they have expanded above average in the last three years. According to the analysis carried out with Sentinel-2 satellite images, the fire spread 256,547 km² in 2019, 271,310 km² in 2020, and 173,627 km² in 2021.

The area affected by burning and wildfires during these last three years reached a cumulative total of 701,484 km², an area impacted much larger than France.

Fifty-nine percent of the areas affected between 2019 and 2021 are new areas, i.e. areas that were impacted by fire for the first time. In the remaining 41%, burns and wildfires were recurrent.

At the height of the pandemic, in 2020, burns and wildfires expanded 6% more than in 2019. Despite the restrictions and encapsulation of human life, the ecosystems of the Amazonia were not spared by the fire.

The annual numbers of burns and wildfires are the product of a detailed monthly analysis to determine the dynamics and extent of fires in the Amazonia. The areas affected by fire were delimited monthly from the burn scars detected with satellite images of the Sentinel-2 sensor of the European Space Agency (bands 5, 6, 7, and 8A with 20 meters of spatial resolution), contrasted with information obtained from the hot spots (points where a burn or fire is probably occurring) of the VIIRS Sensor of the NPP-Suomi satellite of NASA (National Aeronautics and Space Administration).

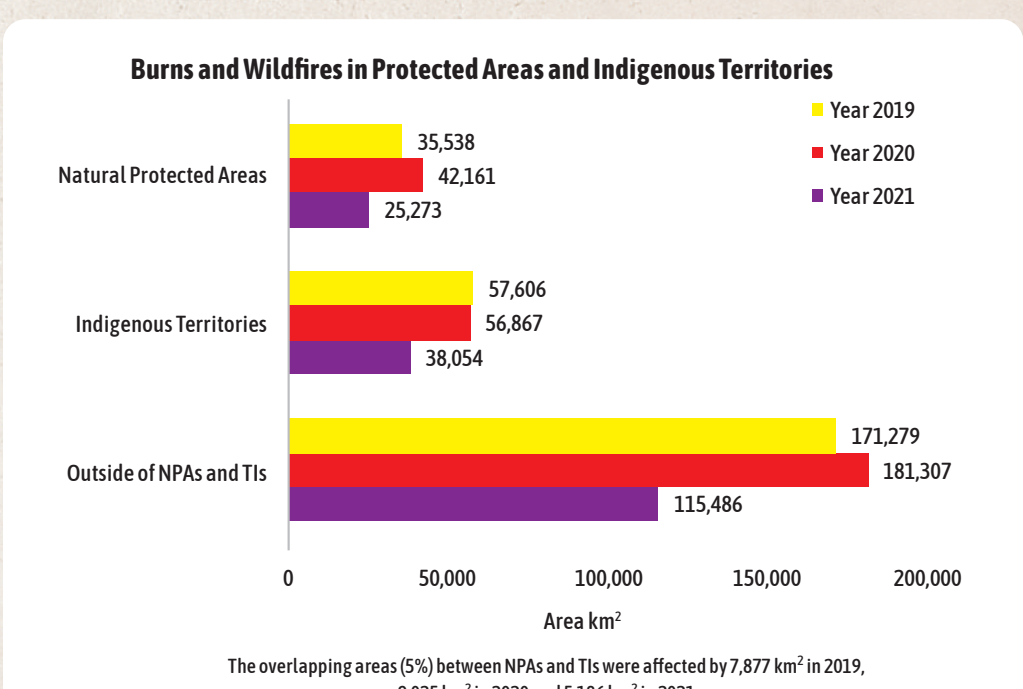


BURNS AND WILDFIRES IN NATURAL PROTECTED AREAS AND INDIGENOUS TERRITORIES

Natural Protected Areas (NPAs) cover 2,144,608 km² (25.2%) and Indigenous Territories (ITs) cover 2,418,705 km² (28.6%) between them, there is an overlap of 435,547 km² (5.1%). Together, NPAs and ITs comprise 48.7% of the Amazonia.

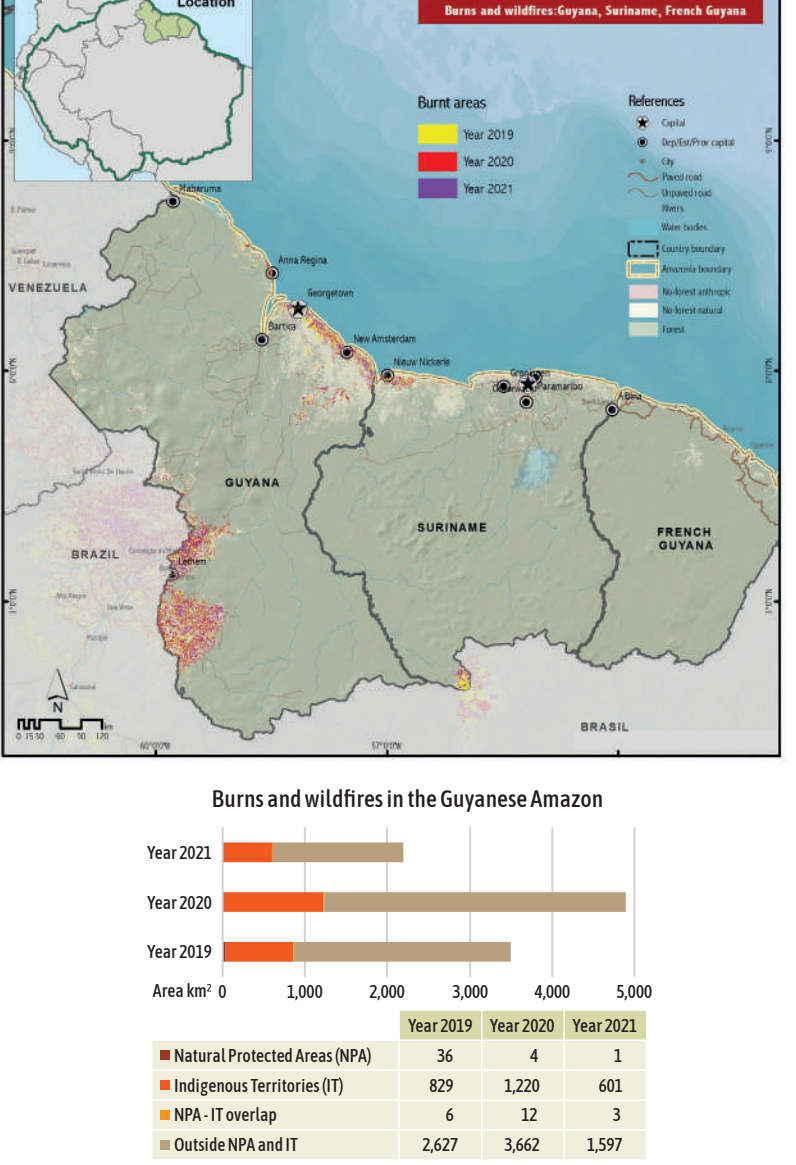
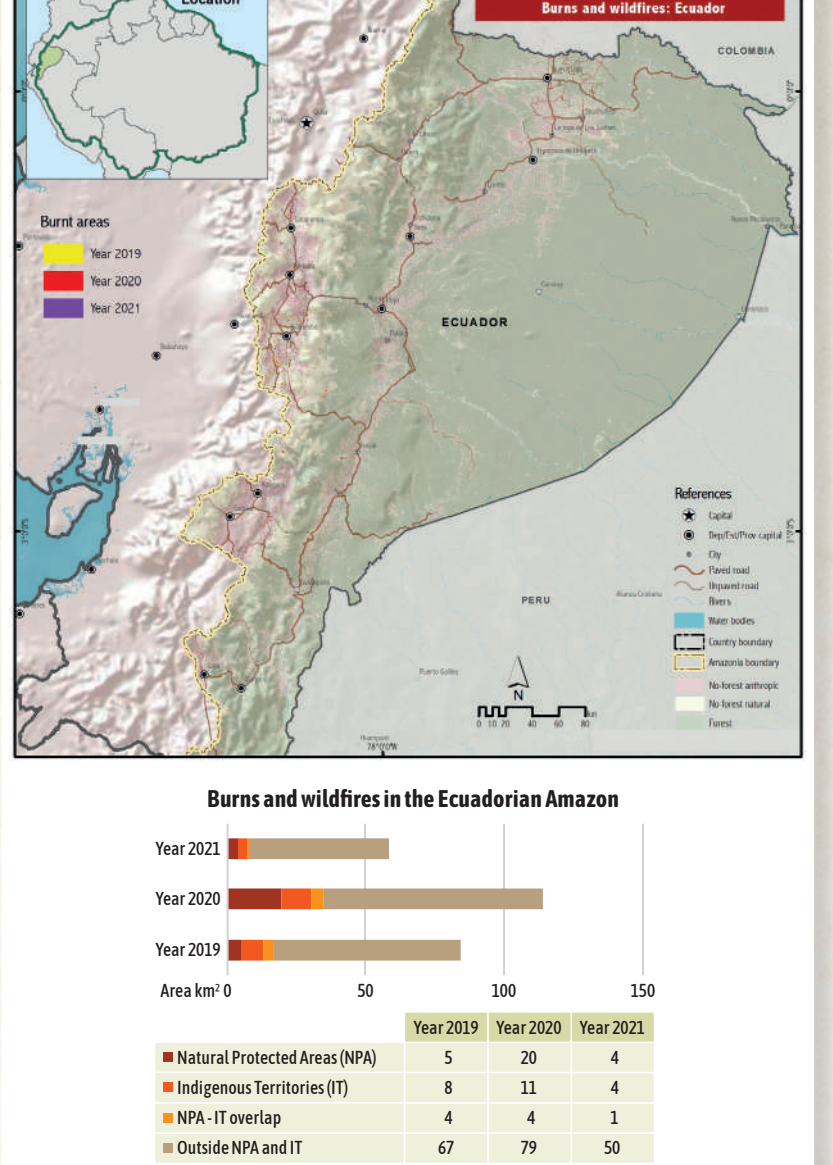
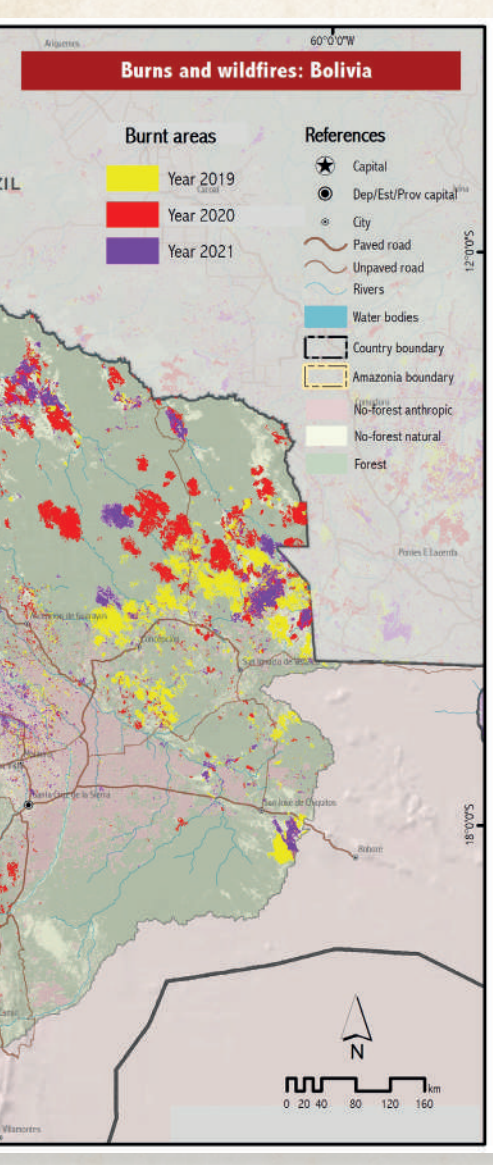
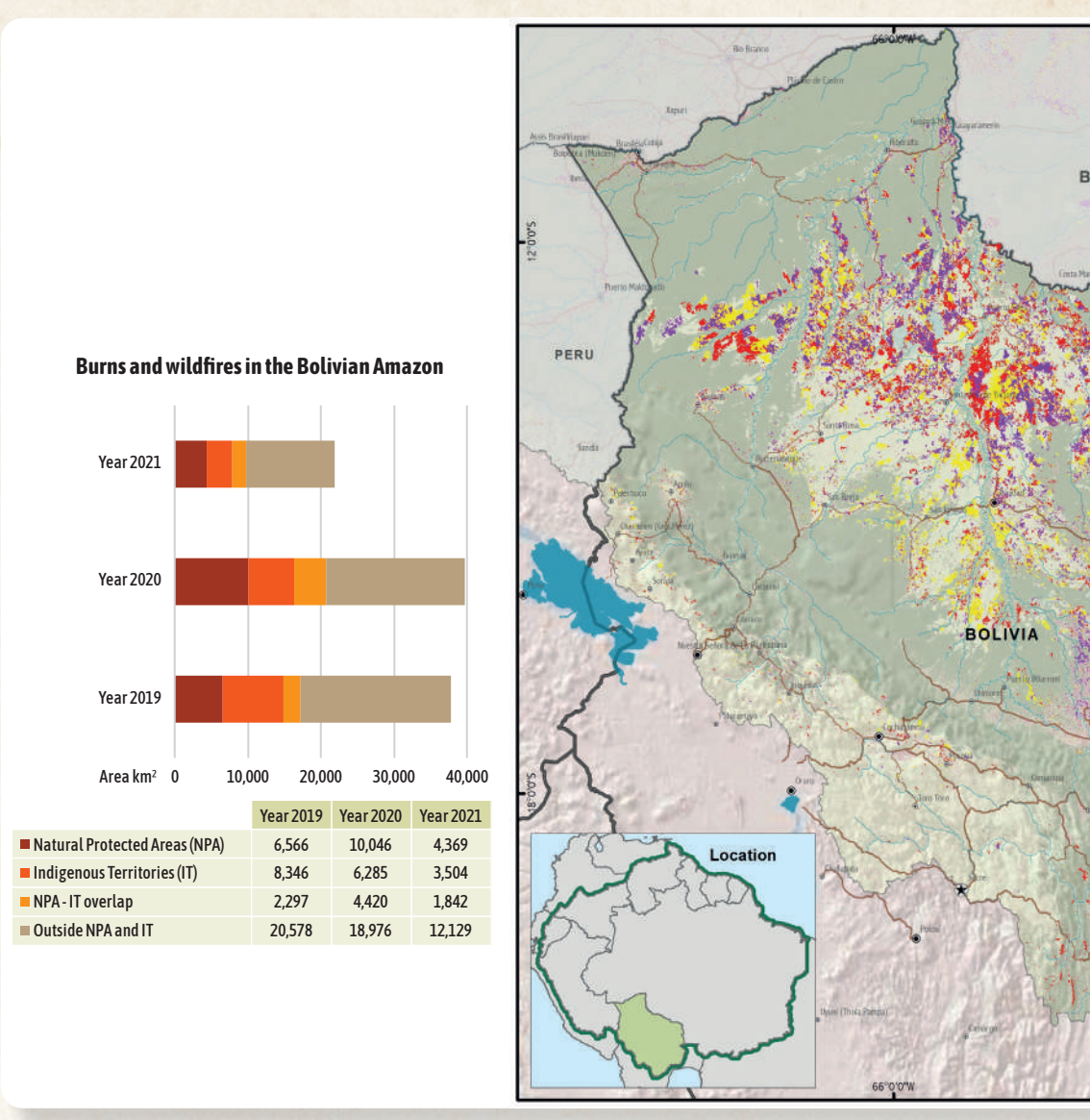
Fires are increasingly expanding into the NPAs. In 2019 they covered 35,538 km², in 2020 they increased to 42,161 km², and in 2021 they reached 25,273 km². Sixty percent of the affected areas were in new areas, although some could be impacted before 2019. The remaining 40% of affected areas suffered recurrent fires between 2019 and 2021.

In ITs, fires affected 57,606 km² in 2019, 56,867 km² in 2020, and 38,054 km² in 2021. Between 2019 and 2021, 45 percent were started in new areas, and 55 percent were sparked in areas with recurring fires between 2019 and 2021.



As with other pressures, areas located outside NPAs and ITs experience greater expansion of burns and wildfires. In 2019 they impacted 171,279 km², in 2020 they consumed 181,307 km², and 115,486 km² in 2021.

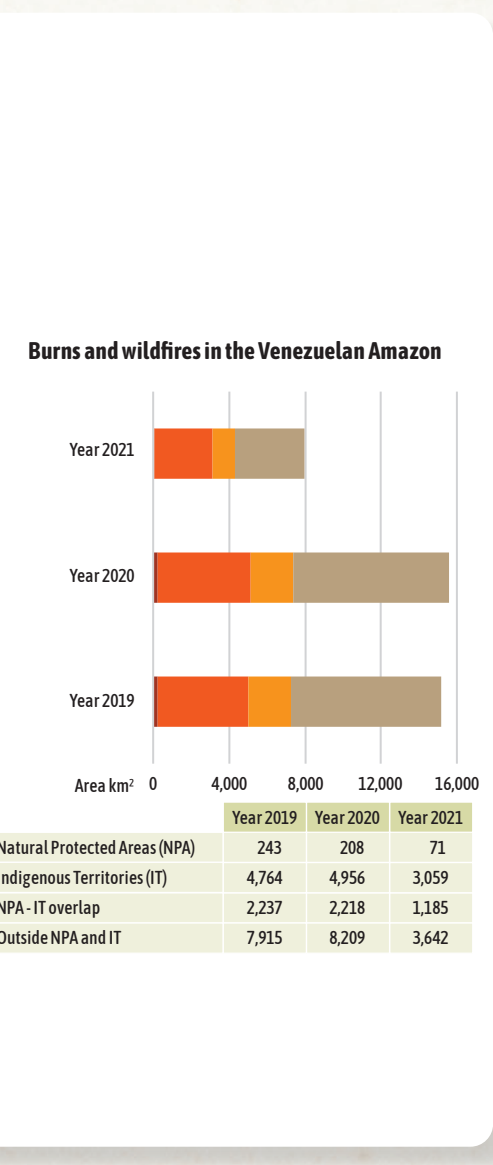
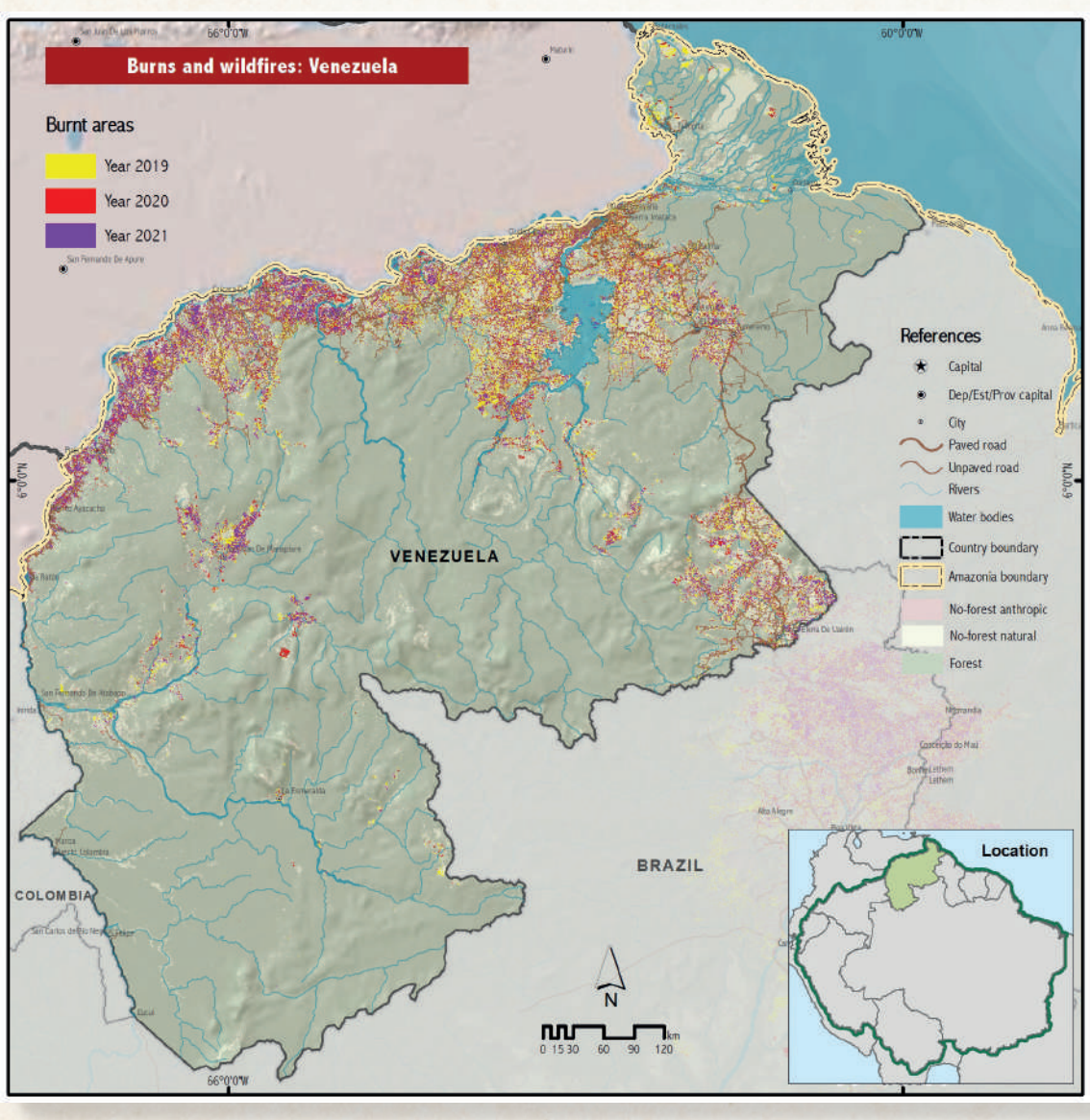
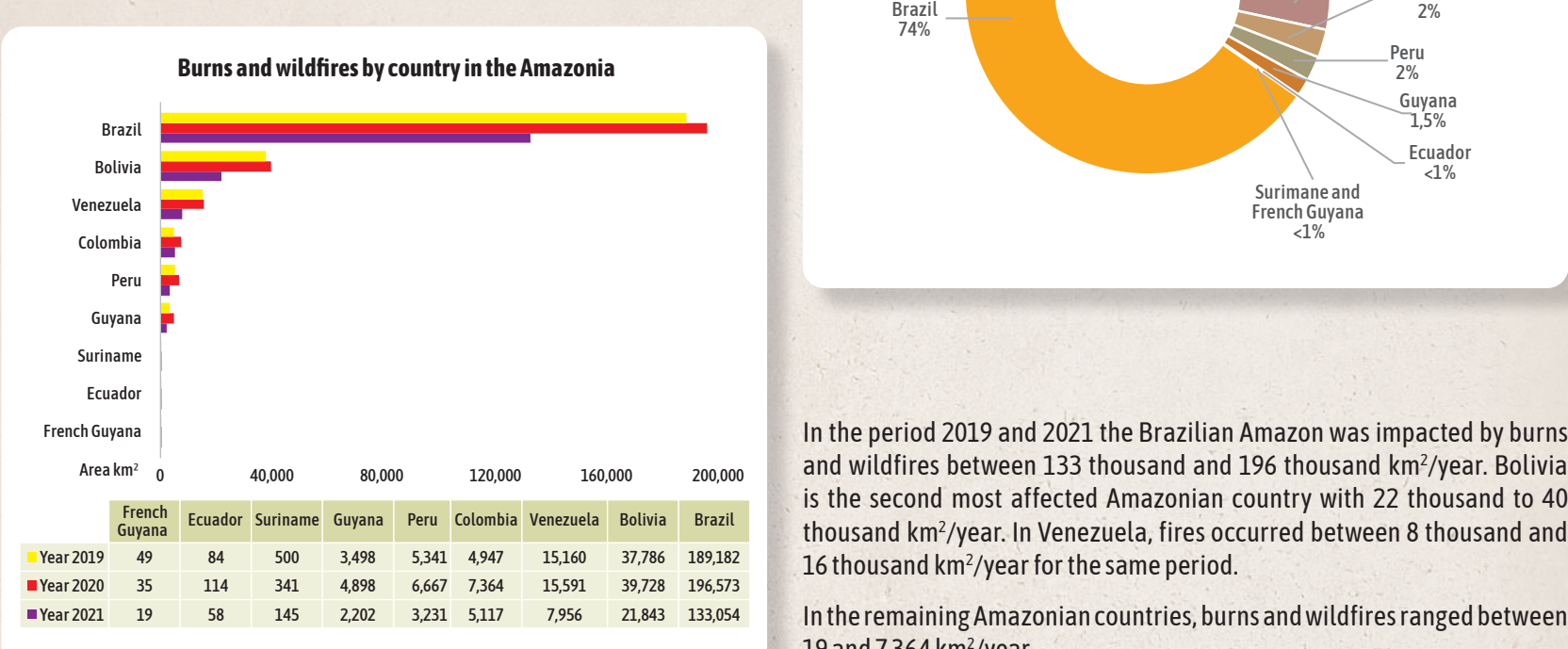
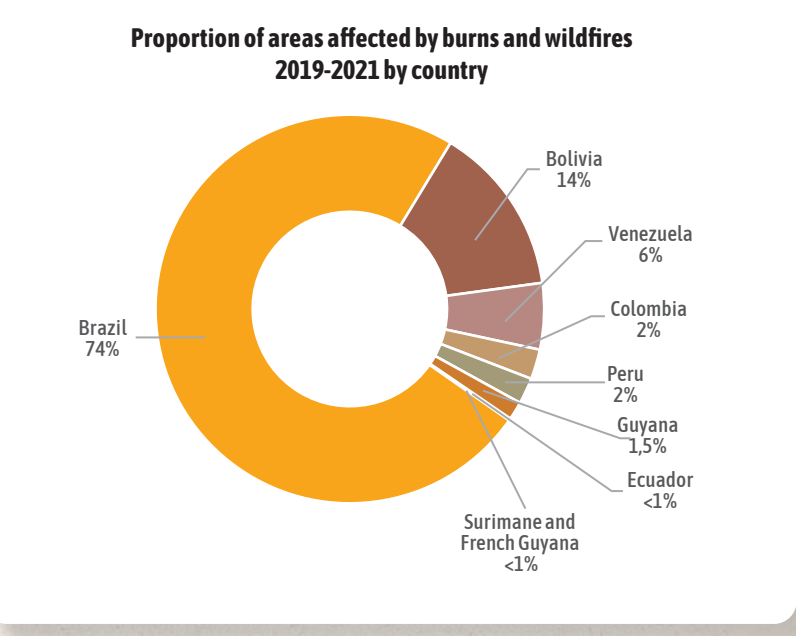
In the middle of the pandemic, 2020 was the year of greatest impact. In NPAs, fires increased by 19% more. Outside NPAs and ITs, they increased by 6% more compared to 2019. In 2021, fires were lower than in the previous year, possibly due to the increase in precipitation in that year caused by La Niña phenomenon, which slowed down the spread of fires. Fires affected more outside of NPAs and ITs; between 2019 and 2021 an average of 3.6% of their extension was affected. In NPAs, the proportion affected was 1.6% and in ITs, 2%.



BURNS AND WILDFIRES IN THE AMAZONIA BY COUNTRY

Wildfires and burns are not homogeneous across the countries that comprise the Amazonia. Ninety-four percent of the affected areas are concentrated in the Brazilian (74%), Bolivian (14%) and Venezuelan (6%) Amazon region.

The remaining 6% of fires are located in the Colombian Amazon (2%), Peru (2%), Guyana (1.5%), Ecuador (1%), Suriname (1%) and French Guyana (1%).



CLOSING REMARKS

In the last three years, burns and wildfires in the Amazonia exceeded the annual average (170 thousand km²/year) of areas affected in the last two decades. In 2019 the fire advanced 51% more, 2020 was even more critical, exceeding it by 60% and in 2021 by 2% more than the average. The accumulated areas under fire between 2019-2021 adds up to an area larger than France (701,484 km²).

Of the total area affected by burns and wildfires, 59% occurred in new areas, and the remaining 41% in recurrent areas. On the other hand, 2020 was a year of high impact for the Amazon: 271,310 km² (larger than New Zealand) were under fire while the COVID-19 pandemic hit the entire world.

The Amazon is going through a very heterogeneous dynamic of burns and wildfires. In the northern region, in the countries of Venezuela, Colombia and Brazil, most fires occur between January and April while in the southern region, in Brazil, Bolivia and Peru, fires take place between June and October.

Burning and fires also impact Natural Protected Areas (NPA) and Indigenous Territories (IT), 33% of the total area occur in these territorial entities, and despite their effects, they continue to be key to containing the spread of fire. 67% of fires occur outside NPAs and ITs. The most affected countries in NPAs and ITs are Bolivia, Suriname and Venezuela.

In the Amazon, 94% of burns and fires occur in Brazil, Bolivia and Venezuela. Between 2019 and 2021, the fire progressed to ecosystems where it was not usual, to the southwest of Brazil and between borders to the east of Bolivia.

Comprehensive measures to counteract the impacts of burning and fires are urgently needed. With each event, fire silently degrades ecosystems, altering their ecological functionality and the livelihoods of their inhabitants.

Citation:
RAISG. 2022. Amazonia Under Fire. Burns and wildfires maps 2019, 2020 y 2021. Red Amazonia de Información Socioambiental Georreferenciada.

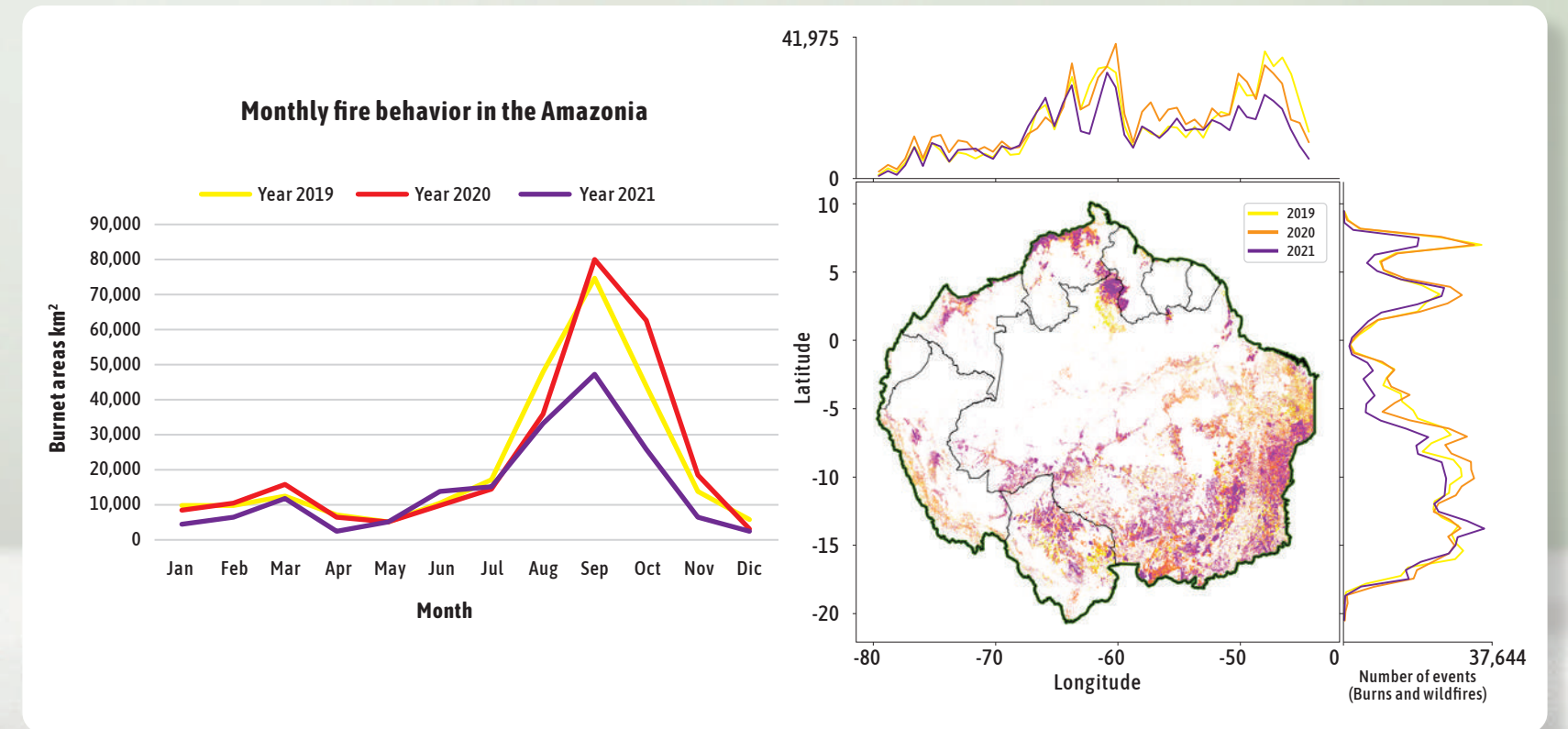
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Due to the multiple factors involved, the monthly and multi-annual dynamics of burns and wildfires in the Amazonia are complex. Changes in land use and the expansion of agricultural activities, along with changes in climatic conditions (droughts and increased temperatures), policies, and market demand, determine the magnitude and extent of fire in the Amazon.



The spatial and temporal patterns of burns and fires in the Amazon are bimodal. In the northern region, between Venezuela, Colombia, and portions in Brazil, most fires occur between January and April, with March being the most critical month. This period coincides with the dry season in this region. In the southern Amazon, in Brazil, Bolivia, and Peru, burns and wildfires are more prevalent between June and October, with September being the critical month, due to the intensification of slash-burn activities and because the water deficit in the soil is more intense.

At the national scale, the Amazon countries were mainly affected in areas outside NPAs and ITs; 67% of the burns and wildfires occur outside these areas, covering 171,000, 181,000 and 115,000 km²/year in the period 2019-2021.

Thirty-three percent of burns and wildfires are located within NPAs and ITs, affecting between 85,000, 90,000 and 58,000 km²/year in 2019, 2020 and 2021, respectively. The most affected countries with fires within NPAs and ITs are Bolivia, Suriname and Venezuela.

Geographic area	Burns and wildfires year 2019 in km ²					Burns and wildfires year 2020 in km ²					Burns and wildfires year 2021 in km ²								
	Amazonia by country (km ²)	Protected Natural Areas (NPA) and IT	Indigenous Territories (IT)	Overlap NPA and IT	Outside NPA and IT	Amazonia by country (km ²)	Protected Natural Areas (NPA) and IT	Indigenous Territories (IT)	Overlap NPA and IT	Outside NPA and IT	Amazonia by country (km ²)	Protected Natural Areas (NPA) and IT	Indigenous Territories (IT)	Overlap NPA and IT	Outside NPA and IT				
Bolivia	714,834	4,566	8,346	2,297	20,578	37,796	5.6%	10,046	6,285	4,420	18,976	39,728	5.6%	4,369	3,504	1,842	12,219	21,843	2.1%
Brazil	5,238,589	20,272	33,221	3,316	132,373	189,182	3.6%	22,289	33,739	2,348	140,197	196,573	3.8%	15,384	23,808	2,248	91,714	133,054	2.5%
Colombia	506,181	110	1,190	2	3,644	4,947	1.0%	243	1,875	2	5,245	7,364	1.5%	127	1,402	3	3,585	5,117	1.0%
Ecuador	132,292	5	8	4	67	84	0.1%	20	31	4	79	114	0.1%	4	4	1	50	58	0.0%
Guyana	212,157	36	829	4	2,627	3,498	1.7%	4	1,200	32	3,662	4,898	2.3%	1	461	31	1,587	2,082	1.0%
French Guyana	84,226	12	0	1	36	49	0.1%	11	0	0	23	35	0.0%	4	0	0	15	19	0.0%
Peru	964,390	110	1,371	13	3,847	5,341	0.6%	380	1,756	21	4,710	6,667	0.7%	41	490	4	2,696	3,211	0.3%
Suriname	146,523	307	0	0	192	500	0.3%	135	0	0	266	341	0.2%	86	0	0	58	145	0.1%
Venezuela	470,219	243	4,764	2,237	7,915	15,160	3.2%	208	4,956	2,218	8,209	15,991	3.3%	71	3,059	1,385	3,642	7,956	1.7%
AMAZONIA	8,470,209	27,662	49,759	7,837	171,279	256,547	3.0%	33,316	49,942	9,625	181,307	271,310	3.2%	20,887	32,667	5,136	115,486	173,627	2.0%

The role of NPAs and ITs in Amazonian countries is essential. Between 53% and 78% of burns and wildfires at the scale of each country are triggered outside NPAs and ITs. Suriname and Venezuela report fire inside the most NPAs and ITs in absolute and similar proportions. In the last three years, 2020 was the year with the highest impact. 3.2% of the Amazonia was under fire. At the country level, in the same year, the Amazonian areas of Bolivia (5.6%), Brazil (3.8%), and Venezuela (3.3%) were the most affected.

RAISG

The AMAZONIAN NETWORK OF GEORREFERENCED SOCIOENVIRONMENTAL INFORMATION is a space for the exchange and articulation of geo-referenced socioenvironmental information, at the service of processes that positively link collective rights with the valuation and sustainability of socioenvironmental diversity in the Amazon region.

RAISG generates and disseminates knowledge, statistical data and geospatial socioenvironmental information to contribute to better known, appreciate and care of the Amazonia.

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