# Deforestation in northern Argentina Annual Report 2022





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# Introduction

Forests account for more than half of the planet's terrestrial biodiversity; and provide indispensable services for our survival, such as food, timber and medicines. Forests are the territory of indigenous and peasant communities; and have a fundamental role in climate regulation, maintenance of water sources, and soil conservation.

Argentina is in a forest emergency. According to the National Ministry of Environment and Sustainable Development data, between 1998 and 2021, the loss of native forests in the country was close to 7 million hectares, an area similar to Scotland.<sup>1</sup>

Provincia	×	Pérdida de Tierras Forestales y de Otras Tierras Forestales por período y provincia (ha)																	
	2007	2008- 2011	2012- 2013	2014	2015	2016	2017	2018	2019	2020	2021	2018	2019	2020	2021	2018	2019	2020	2021
	Yungas, Parque Chaqueño, Selva Paranaense y Espinal												Bosque Andino Patagónico y Monte				Total regiones		
Buenos Aires	236	396	1.668	31	43	299	528	193	1.958	869	662	200	335	373	370	393	2.293	1.242	1.032
Catamarca	9.571	12.163	6.873	272	664	3.184	2.120	600	1.781	7.834	2.025	13	2	0	6	613	1.783	7.834	2.031
Chaco	71.552	110.889	107.145	19.350	22.797	29.383	43.780	39.774	17.550	35.915	24.427	-				39.774	17.550	35.915	24.427
Chubut			100	-	23			25	(17)	- 11 <b>7</b>	2	31	599	156	9.266	31	599	156	9.266
Córdoba	31.255	39.936	5.048	2.038	679	350	935	226	732	64.886	5.190	-	<u>_</u>	12	-	226	732	64.886	5.190
Corrientes	1.137	4.111	1.479	990	600	0	31	187	133	1.583	1.065		87	85		187	133	1.583	1.065
Entre Ríos	42.856	51.987	23.166	5.854	5.866	2.370	2.818	1.850	3.625	3.514	9.024	1	1	16	2	1.850	3.625	3.514	9.024
Formosa	44.737	129.603	96.775	25.476	19.324	29.521	23.086	23.705	24.442	48.549	33.345	-				23.705	24.442	48.549	33.345
Jujuy	1.826	14.843	9.082	1.492	2.032	623	1.341	905	1907	25.525	3.698	2	0	0	0	907	1.907	25.525	3.698
La Pampa	2.643	3.164	1.504	8.137	5.357	3.890	10.925	32.983	11.995	5.035	1.959	498	200	49	2.464	33.481	12.195	5.084	4.423
La Rioja	6.289	25.683	17.571	7.298	10.893	14.242	3.933	1.688	2.807	3.252	6.989	1	42	0	0	1.689	2.849	3.252	6.989
Mendoza	12	1 1 1 1	82	-	22	1	12	1	323	192	12	2.091	626	6	18	2.091	626	6	18
Misiones	16.989	21.406	5.614	1.011	969	1.001	3.418	1.589	2.871	6.123	3.324	-				1.589	2.871	6.123	3.324
Neuquén	10	1	9.5	-				10	1070	100	2	280	186	793	2.886	280	186	793	2.886
Río Negro	1	14		-	2	<u> </u>	) i	-	-	(a.)	82	126	616	573	9.705	126	616	573	9.705
Salta	204.697	236.246	213.327	57.396	39.635	24.916	20.465	19.438	16.830	55.868	13.925	52	4	0	31	19.490	16.834	55.868	13.956
San Juan	0	79	765	0	0	0	0	0	0	17	60	68	41	42	12	68	41	59	72
San Luis	30.751	79.638	25.612	9.783	10.502	12.358	19.911	28.137	20.177	22.532	9.931	0	0	0	2	28.137	20.177	22.532	9.933
Santa Cruz		1		-							2	44	41	67	24	44	41	67	24
Santa Fe	9.580	11.692	5.397	1.958	1.700	539	1.139	58	407	1.864	3.764		-	12		58	407	1.864	3.764
Santiago del Estero	247.479	453.551	172.058	48.623	34.974	33.004	36.988	32.022	28.075	44.540	59.942	-	-	-	9	32.022	28.075	44.540	59.942
Tierra del Fuego			-	-	8				34	14	8	57	313	131	163	57	313	131	163
Tucumán	6.871	18.467	14.187	1.330	844	171	1.221	13	1.247	3.126	1.215	0	0	0	0	13	1.247	3.126	1.215
Total	728.469	1.213.854	707.271	191.039	156.879	155.851	172.639	183.368	136.537	331.032	180.545	3.463	3.005	2.190	24.947	186.831	139.542	333.222	205.492

#### Loss of Forest Land and Other Forest Land by Period and Province (hectares)

Source:National Ministry of Environment and Sustainable Development

Approximately 80% of deforestation is concentrated in four northern provinces: Santiago del Estero, Salta, Chaco and Formosa. Mainly in the Gran Chaco, which is the second largest forest ecosystem in South America and one of the most biodiverse areas in the world, with 3,400 plant species, 500 birds, 150 mammals, 120 reptiles and 100 amphibians.<sup>2</sup>

<sup>&</sup>lt;sup>1</sup> Forest Assessment System Management Unit. Ministry of Environment and Sustainable Development of the Nation. <u>https://www.argentina.gob.ar/ambiente/bosques/umsef</u>

<sup>&</sup>lt;sup>2</sup> Atlas of the American Gran Chaco. Patricia Maldonado and Evelyn Hohne. 2006 https://redaf.org.ar/wp-content/uploads/2008/02/ATLAS\_GRAN\_CHACO\_ES.pdf

The leading causes of forest loss are the advance of the agricultural frontier (cattle ranching and GM soy, which are largely exported to Asia and Europe) and forest fires.

Agriculture, livestock, forestry and deforestation account for 37% of the country's Greenhouse Gas (GHG) emissions, contributing to the current climate crisis.

The enactment of the National Forest Law (26.331) at the end of 2007 was an unprecedented achievement and an example of the importance of civil society participation, which put pressure on the National Congress with 1.5 million signatures.<sup>3</sup>

After fifteen years of implementing this regulation, all the provinces have completed the Territorial Ordinance of their Native Forests (OTBN), which prohibits clear-cutting in almost 80% of the forest areas (Categories I, Red and II, Yellow).

However, Formosa, Corrientes and Buenos Aires zonings were highly questioned for establishing large areas classified in Category III, Green, where it is permitted to apply for clearing permits.

On the other hand, some zonings (Salta, Chaco) were illegally modified by provincial governments through the systematics field re-zoning, which reduced the areas where land clearing was prohibited.

It is important to highlight that just a few provinces have updated their OTBN, which according to the regulations of the national norm, must be done every five years with a participative process.

Although deforestation has decreased since 2014, half of the deforestation occurs in areas where it is not permitted. On the other hand, forest fires have increased significantly in the last three years.

This report reveals the deforested area between January and December 2022 in Santiago del Estero, Chaco, Formosa and Salta provinces. It is important to clarify that areas of native forests affected by fires were not included in the satellite survey.

<sup>&</sup>lt;sup>3</sup> <u>http://servicios.infoleg.gob.ar/infolegInternet/anexos/135000-139999/136125/norma.htm</u>

# Santiago del Estero

Deforested area in 2022: 38,492 hectares



Documentation of land clearing in Santiago del Estero. September 2022.



Photos: Greenpeace

# Chaco

#### Deforested area in 2022: 36,159 hectares



Documentation of land clearing in Chaco. October 2022.



Photos: Luis Robayo. AFP

# Formosa

Deforested area in 2022: 22,664 hectares.



Documentation of land clearing in Formosa. July 2022.



Photos: Greenpeace

# Salta

Deforested area in 2022: 15,230 hectares.



# **Forest fires**

According to National Fire Management Service (SNMF) reports, the area affected during 2022 by Forest, Rural and/or Wildland Urban Interface Fires was about 95,000 hectares in Salta and 25,000 hectares in Jujuy, including nearly 5,000 hectares in the Calilegua National Park.<sup>4</sup>

A forest fire is considered "a fire that spreads freely with undesirable effects on vegetation and is not subject to human control. When it affects areas that are not forested or suitable for afforestation, the term rural fire is included, (...) affecting scrub, bush and/or grassland vegetation". The interface fires "develop in contiguous wildland-urban areas or where vegetation is intermingled with building structures such as dwellings, agricultural establishments, etc.". <sup>5</sup>

As for the causes, it is estimated that "95% of forest fires are man-made, the main scenarios being fires and badly extinguished cigarette butts, the abandonment of land, the preparation of grazing areas with fire. Climatic factors such as lack of rainfall, high temperatures, low humidity, constant frosts, and strong winds contribute to the spread of forest fires".<sup>6</sup>



#### Documentation of forest fires in Salta. November 2022.

https://www.argentina.gob.ar/ambiente/fuego/alertatemprana/reporte-ocurrencia

<sup>&</sup>lt;sup>4</sup> Forest, Rural and/or Wildland Wildfire Reports. National Fire Management Service (SNMF). National Ministry of Environment and Sustainable Development.

<sup>&</sup>lt;sup>5</sup> National Fire Management Service (SNMF). National Ministry of Environment and Sustainable Development. <u>https://www.argentina.gob.ar/ambiente/fuego/conocemas/incendioforestal</u>

<sup>&</sup>lt;sup>6</sup> https://www.argentina.gob.ar/sinagir/incendio-forestal



Photos: Greenpeace

# Conclusions

Deforestation during 2022 in northern Argentina was 112,545 hectares (Santiago del Estero 38,492 hectares, Chaco 36,159 hectares, Formosa 22,664 hectares, and Salta 15,230 hectares).

It is serious that more than 80% of the deforestation in Santiago del Estero province was illegal, as it was carried out in forests classified in Categories I, Red and II, Yellow, where it is not permitted.

It is important to warn about the illegality of the 36,159 hectares deforested during 2022 in Chaco province, since the deforestation has been suspended by the provincial justice since 16 October 2020, due to the lack of updating of its Territorial Ordinance of Native Forests.<sup>7</sup>

In this sense, the increase in deforestation compared to the year 2021 when, also illegally, 24,427 hectares of native forests were lost in the province of Chaco, is very worrying.<sup>8</sup>

Regarding forest and rural fires during 2022, official reports highlight Salta province with about 95,000 hectares and Jujuy with approximately 25,000 hectares burned.

Preliminarily, the sum of deforested and burned areas suggests that the loss of native forests during 2022 in northern Argentina could exceed 200,000 hectares.

It is clear that fines are not enough to discourage illegal deforestation and forest fires; and those responsible are rarely forced to reforest. In many cases, the complicity of officials is clear.

We are facing a climate and biodiversity emergency. More deforestation means more climate change, floods, desertification, evictions of peasant and indigenous communities, disappearance of endangered species and diseases.

With this alarming situation, Greenpeace demands that deforestation and forest fires be banned and penalized as a matter of urgency.

<sup>&</sup>lt;sup>7</sup> <u>https://es.scribd.com/document/480435462/Medida-cautelar-freno-la-actividad-forestal-en-Chaco</u>

<sup>&</sup>lt;sup>8</sup> Forest Assessment System Management Unit. Directorate of Forests. Ministry of Environment and Sustainable Development of the Nation. https://www.argentina.gob.ar/ambiente/bosques/umsef

# Annex: Methodology

To produce this report, different layers of information were necessary:

- Vector layer of land clearing in the Chaco Seco region, generated by the Laboratory of Regional Analysis and Remote Sensing of the Faculty of Agronomy of the University of Buenos Aires.<sup>9</sup>
- Vector layer of the provinces of Santiago del Estero, Chaco, Formosa and Salta, obtained from the National Geographic Institute.<sup>10</sup>
- Vector layer of the departments of the four provinces of Santiago del Estero, Chaco, Formosa and Salta, obtained from the National Geographic Institute.<sup>11</sup>
- Vector layer of the OTBN of the provinces of Santiago del Estero, Chaco, Formosa and Salta, obtained from the Chaco Argentina Agroforestry Network (Redaf).<sup>12</sup>

It is important to note that all the layers must have the same projection. In this case, the projection used was Posgar 98, and the strip corresponding to each province. This projection was used because it allows areas to be calculated. To visualize the clearings, Landsat 8 Surface Reflectance OLI/TIRS images were downloaded from the United States Geological Survey (USGS) for all the months of 2022. The spatial resolution of the sensor is 30 meters and the temporal resolution is 16 days. Priority was given to images with low cloud cover. Sentinel 2 images, provided by <a href="https://eos.com">https://eos.com</a>, were obtained to complement the analysis. Once downloaded, they were processed using ENVI (image processing and analysis software), transforming them into a false color composite (RGB combination of 5-6-4 bands). This combination makes it possible to distinguish the different types of vegetation.

The processed images were processed with the geographic information system QGIS 2.14.3. The transformed areas were detected by visual interpretation of the images of the month of interest and the previous month superimposed. In this way the new clearings can be distinguished. The incorporation of the cuttings into the vector layer was done by drawing a polygon on the image and filling in the year and month data. Then, the name of the province and department where the clearing was carried out, the area covered and the corresponding category in the OTBN were filled in. The QGIS calculator was used for the area data. It has a function "\$area" that calculates the area in m2 of the polygons. This unit is divided by 10,000 and converted into hectares using the same tool. For the department and OTBN data, the layers were cross-referenced and merged by location; in this way, each digitized clearcut contains the department information and the OTBN category to which it corresponds.

As mentioned above, the land-clearing vector layer corresponds to the Chaco Seco region. This region only partially covers all four provinces. Chaco and Formosa have a portion of their surface in the Humid Chaco. To circumvent this drawback, "no category" from the OTBN of both provinces was used to mask that portion that is considered as non-forest and thus be able to differentiate clearings in the other categories.

January 2023 Forest Campaign

<sup>10</sup> <u>http://www.ign.gob.ar/sig</u>

<sup>&</sup>lt;sup>9</sup> <u>http://monitoreodesmonte.com.ar/</u>

The monitoring of deforestation in the Chaco Region is the result of the articulation of efforts and capacities between the Regional Analysis and Remote Sensing Laboratory (LART) of the Faculty of Agronomy of the University of Buenos Aires (FAUBA), the National Institute of Agricultural Technology (INTA) and the Chaco Argentina Agroforestry Network (Redaf).

<sup>&</sup>lt;sup>11</sup> Idem.

<sup>&</sup>lt;sup>12</sup> <u>http://redaf.org.ar/</u>



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